Savings and Farm Investment in Bangladesh: An Analysis of Rural Households

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CIRDAP

Centre on Integrated Rural Development for Asia and the Pacific

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Foreword

In Bangladesh, explicit focus on poverty eradication in the development agenda requires formulation and implementation of sustainable anti-poverty strategies. The availability of reliable and timely information on the state and processes of poverty assists the policy makers in understanding poverty in its manifold dimensions and in identifying the causalities. The above requires institutional mechanism to (i) monitor poverty using multidimensional indicators; (ii) analyze micro impact of macroeconomic and structural adjustment policies; (iii) provide feedback to the policy makers in designing effective macro and poverty reduction policies.

CIRDAP, with assistance from the International Development Research Centre (IDRC), Canada and Canadian International Development Agency (CIDA) initiated a project on `Monitoring Adjustment and Poverty (MAP) in Bangladesh to address the above issues. Under the project, a number of `focus studies' were conducted on poverty related issues. These studies generate information on the nature and conduits through which macro-policies create impact at the micro level along with providing relevant information on poverty.

The present study on `Savings of farm Investment in Bangladesh: An Analysis of Rural Households' investigates the impact of the structural adjustment policies on the rural farm households. The study examines among others: (i) farm size relation to savings and investment, (ii) poverty impact on savings and investment, and (iii) impact of savings and investment on education, occupation, crisis, credit availability, and access to road, market and banking services. The conclusions of the study highlight the priorities for future research and policy concerns.

I hope the study will be useful to the policy makers and experts in the area. I would like to thank Dr. Rushidan Islam Rahman and Dr. Mustafa k. Mujeri, the researchers of the study, for their excellent work. I also thank Dr. Muhammed Solaiman, Director Research, CIRDAP who coordinated the study to bring into its final shape and other staff of CIRDAP Research Division including MAP Staff for their efforts in successfully completing the study. I express my gratitude to Dr. Rohinton Medhora and Dr. Rodney Schmidt of IDRC for his active interest in the project and to IDRC and CIDA for providing financial support for the project.

August 2000

Dr. Mya Maung
Director General

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Executive Summary

I. Introduction

An analysis of the savings and investment behaviour of rural households is pertinent for understanding the constraints to agricultural growth. Rural households are likely to contribute a substantial part of such savings not only for being more numerous but also through their high saving propensities. This suggests the need for an indepth analysis of various aspects of rural savings and investment and for estimation of national savings rate on the basis of a large sample that is attempted in the present study. The objective of the present study is to provide an analysis of the savings rate of rural households and examine their investment pattern so that appropriate measures may be suggested to accelerate agricultural development in Bangladesh. The major source of data for the present study is the Rural Poverty Monitoring Survey (PMS) conducted by the Bangladesh Bureau of Statistics (BBS) in the months of April of 1996 and 1997.

II. Savings Rate

The differences between income and two alternative measures of consumption provide two estimates of savings in the present study.

These are:

- Net savings (s) as measured under the traditional concept; and
- Net savings including investment in human capital (shc).

The savings rate (s) in the rural areas stands at 16.3 per cent of the rural income. A large per centage of this savings comes from the higher income groups. The savings rates in the two highest income groups are 24 per cent and 51 per cent respectively. In the income group just above the poverty line, the savings rate is close to zero. In the two lowest income groups, net dissaving is observed.

These values of savings have been obtained as net of the positive and negative savings within each income group. There are positive and negative savers among all income groups. High income groups have fewer negative savers and, therefore, net savings rate is positive while the reverse is true of the lower income groups.

The savings rate including investment in human capital (shc) is 19.7 per cent which is 3.4 per cent higher than the traditional savings rate. This indicates that human capital formation accounts for 3.4 per cent of total rural income.

It is observed that the relationship of savings rate with land ownership of the households is not as strong as with income. The savings rate is positive even among the low landowning groups and is similar for the medium land ownership groups (1.00 to 1.99 acres and 2.00 to 4.99 acres). This is a reflection of the fact that income is the predominant determinant of savings and land ownership accounts for less than half of the income for most households.

The 1995-96 HES provides information on savings rate

i) The savings rate from HES is much lower than the rate obtained in the present study (6.3 per cent compared to 16.3 per cent); and
ii) The savings rate from HES shows fluctuations over time. It declined during 1984 to 1989, increased in 1992 but declined drastically in 1996.

The second feature is somewhat difficult to explain particularly when placed in the context of trends in domestic investment.

II. Savings Function

A Keynesian saving function has been estimated. The estimated coefficients and the constant term conforms to the Keynesian hypothesis of MPS as less than one and the APS being less than MPS (the intercept term being negative). The value of MPS is 0.45 and the regression coefficients is highly significant.

An alternative form of savings function, including the individual and household characteristics which may influence the returns to savings, has also been estimated. The coefficient of income in this equation is higher than the simple equation. The 'life cycle' variable represented by age of the head of households has a significant negative coefficient. The coefficient of the amount of credit from institutional sources is not significant. The size of agricultural land owned has a negative coefficient. This is explained by the fact that the sale of land is an important means for financing dissavings. The per centage of income from crops has a negative coefficient. The number of household members has a negative coefficient as expected, as it exerts a pressure on consumption needs. Contrary to expectations, the years of schooling has a negative and significant coefficient which is difficult to explain. The dummy for receiving remittances has a positive but insignificant coefficient. Availability of infrastructural facilities have been included as explanatory variables in the extended savings function. Closeness of bank, 'haat', bus linkage etc. are expected to increase the scope for savings. Access to irrigation and electricity are also included. These factors are likely to increase income and thereby increase savings. But these

factors also represent a modernization of economic activities and, therefore, may directly influence household savings. The coefficient, of all the infrastructure variables except electricity are as expected.

IV. Poverty Crisis and Savings

A disaggregated analysis of the saving propensities of poor and non-poor households is also provided. The lack of savings among the poor should not be viewed as a mere feature of the statistical relationship between income and savings. This is linked to the survival of the poor households.

The rate of savings among the households in the two lowest income groups are negative. About 40 per cent of the households have negative savings with a value of APS (average propensity of save) of –10.00 per cent or less.

A clear negative impact of 'crisis events' on household's realized savings is observed. For almost all income groups, households affected by crisis show a much smaller savings rate or a higher dissaving rate (among the two lowest income groups) compared to households not affected by crisis. Among the poor households, only 18 per cent faced with crisis are positive savers compared to 33 per cent among those who do not face crisis. The impact of crisis on savings of non-poor group is less glaring:64 per cent and 73 per cent among crisis affected and unaffected households respectively are positive savers. Borrowing and dissaving in the form of sale of land are the two major mechanisms used by the poor households to survive during crisis. Credit with high interests as well as credit from interest free or low interest sources also provide a major source of finance for these households. Support from influential village elite has also been obtained by 7 and 4 per cent of the poor and the non-poor households during the crisis. A much larger per centage of the non-poor compared to the poor households depend on own savings and mortgage of land. The households choosing these strategies are less vulnerable since the land mortgaged out may be recovered in future and use of own savings not only saves them from interest payments but also from the obligations arising out of personal loans from friends and relatives and other forms of support from influential persons. Thus the poor households are locked in a circular pattern of crisis and dissaving. One way of breaking the chain is through the provision of credit with low rates of interest.

V. Forms of Household Savings

The forms of household savings depend largely on the motive behind savings, which is guided by the existing asset base and investment portfolio. The absence of saving services

makes it risky for the rural households to accumulate liquid savings. Therefore, the rural households develop certain practices to substitute for the provision for liquidity. Imperfections in other markets also have implications on the decisions on savings and the forms of savings. Such indirect influence takes place through their effect on the returns to savings put in different forms.

Agricultural productivity depends not only on farm investment, but also on its stock of capital (accumulated through investments over several years in the past). In this study, the stock of capital as well as the changes in the stock during the last one year (i.e. net investment) are examined.

It is observed that there is no significant change in the use of farm machinery between 1996 and 1997 though the total value of implements slightly increased. Households with ownership of power tillers, power pumps and shallow tubewells increased. The investment in STWs was negative, even though the number of STW owning households increased. This is due to the availability of STWs at lower prices.

It is observed that the stock of other forms of agricultural capital increased during the period. The total value of transport, fisheries, and livestock assets increased by 15.1 per cent, 5.6 per cent, and 4.0 pr cent respectively. Such increases have contributed to a net increase in the value of investment in these assets by about 5 per cent.

A significant part of the savings of rural households is invested in housing and other related investment (e.g., drinking water). The valuation of such investment, however, is not available,. Even after taking into account the investment in trading sector and in housing, a significant part of the savings may be lying idle or being used in informal money lending business. The financial sector should adopt policies for channeling such savings to the formal financial sector.

It is often hypothesized that remittances may improve the asset position of rural households. The pattern of asset ownership among the receivers of remittances and the non-receivers has been examined. An interesting feature which emerges from the data suggests that remittance has a negative relationship with ownership of agricultural assets. The remittance is mostly invested in productive assets for non-farm activities.

To examine whether the differences in asset ownership among farm size groups and among the receivers and non-receivers of remittances are statistically significant, a multiple regression analysis is used. In the analysis, an attempt has been made to identify the influence

of other relevant factors along with farm size and remittances.

As it has been mentioned, one may expect that the flow of remittances may have a positive impact on farm investment. However, this has been negated by the data. In fact, remittances have a negative impact on farm assets, and this is more significant when farm asset is defined in a wider sense to include livestock. The gender of the head of household has been included as a dependent variable to examine whether female headed households face a disadvantaged situation in this respect. This variable, however, turns out to be insignificant. Non-crop income has a significant positive coefficient. Thus there are complementarities between agricultural and non-agricultural activities.

VI. Investment on Agricultural Inputs

The expenditure on current inputs is not included in the traditional definition of investment. However, there is a need for widening the definition, especially for societies with significant agricultural production. In an agricultural production system based on family farming, investment in capital items is not quite common. Fertilizer and irrigation water are the productivity augmenting inputs in such systems.

It is observed that total expenditure on fertilizer has been continuously increasing (except in years 1985-86 and 1993-94). The average annual growth in the value of crop production during the period is 4.43 per cent and the average annual growth in input costs is 12.0 per cent. Thus the farmers are observed to invest a continuously rising per centage of their incomes on inputs and the return from such investment is not only low but declining. During 1990-91 to 1992-93, the expenditure on the inputs increases at a growing rate, yet the growth in GDP from crops shows a declining trend. This is because, the rise in expenditure has been due to increase in the prices of inputs, particularly fertilizer and not due to increases in quantity. In periods of higher prices of fertilizer, farmers' expenditure on inputs increases and still the quantity of inputs is lower than in periods of low input prices. In fact, the farmers do not have alternative areas of investment and, therefore, they are forced to continue to spend on agricultural inputs even if the prices increase. But given their constraints, they cannot maintain the input levels in years of high input prices.

The survey data provide information on current income and the per centage of income spent on inputs and the amount of expenditure on inputs by farm sizes. The per centage of income spent on inputs for crop production and the variation of input use among different farm size and income groups may be used to identify the constraints to such investment.

It is estimated that 5 per cent of total income of rural households is spent on inputs. It is

expected that total expenses on material inputs will increase with farm size. However, the per centage of income spent on inputs does not increase monotonously with the farm size. It increases until 7.50 acre size farms and thereafter slightly declines. This may be due to higher per centage of non-farm income for the larger farm size groups.

VII. Gender and Savings

To understand the gender differences in savings behaviour, the savings rate and savings behaviour among the male and female headed households have been distinguished. In the present study those female headed households who do not receive remittances from male earners have been identified as 'effective female headed households'. Thus two types of female headed households are considered: those who get remittances and those who do not.[1] To compare male and female headed households, the former has also been classified in a similar way. The savings propensities of men and women may be different because of differences in attitude towards savings. At the same time, the difference in the absolute level of savings by women and men deserves attention since total savings in the hands of women is an indicator of their empowerment.

The female headed households, who do not receive any remittances, have a higher savings rate than the corresponding male headed households. Another finding which emerges from such comparison is that in all income groups below the highest group (i.e. less than Taka 7,200), savings rates among female headed households are much larger than the male headed households of the respective income groups. The differences are higher as one goes down the income scale. Thus the fact that households, which are apparently female headed but receive remittances from outside and fall in the highest income strata, have lower savings rate than the corresponding male headed households blurs the picture of the savings efforts of poor women.

The case studies on savings by women provide evidence of ingenuity among women who try to balance between riskiness of investment and return from such investment.

VIII. Policy Implications

The present study shows that the savings rates among the rural households are substantial, about 16 per cent of income in the aggregate, and investment on physical capital does not

[1] Remittances usually come from household's male earners, women sending money has not been observed in the survey data.

account for all savings. It has also been argued that a part of investments in physical capital takes place since facilities for financial savings are lacking. Therefore, it is pertinent that formal financial institutions should make concerted efforts to mobilize rural savings.

It has been revealed that the farm households spend a significant proportion of their income on inputs for agricultural production. In the absence of large investment on physical capital, policies should be adopted to enable the farmers to use material inputs in required quantities. In this respect, the support in the form of short term credit will enable the farmers to plan the use of optimal inputs. Two aspects of such credit facilities deserve attention: high cost of such operations and constraints in timely disbursement of loans. Agricultural inputs must be applied at the right time in the crop season and delayed sanctioning of loans may not serve the purpose. This may also lead to unproductive use of the loan and thus creating problems of non-repayment.

Women's capacity to generate savings, even in the face of various adversities, demands that they receive attention in policies for mobilization of savings. In this respect, they need support from both savings and credit services of the financial institutions.

The savings rate in the rural areas stands at 16.3 per cent of the rural income. A large per centage of this savings comes from the higher income groups. The savings rates in the two highest income groups are 24 per cent and 51 per cent respectively. In the income group just above the poverty line, the savings rate is close to zero. In the two lowest income groups, net dissaving is observed.

The savings rate including investment in human capital (shc) is 19.7 per cent which is 3.4 per cent higher than the traditional savings rate. This indicates that human capital formation accounts for 3.4 per cent of total rural income.

Chapter 1

Introduction

1.1 Background

The economy of Bangladesh is predominantly agrarian even though the relative contribution of agriculture to GDP has been declining consistently. Still the growth rate of GDP is, to a large extent, determined by the growth in agricultural production. The performance of agricultural sector has also a direct bearing on the achievement of the development objectives of the nation, especially those related to employment generation and poverty alleviation. Acceleration of growth in agricultural production, and more specifically in crop production, is also essential to achieve the national objective of self-sufficiency in foodgrains.

The achievement of a reasonable rate of growth in agriculture depends on both public sector development expenditure in this sector as well as on the investment by the millions of farm producers. Given the limited access of farm households to institutional credit, such investment depends largely on their personal savings. Therefore, an analysis of the savings and investment behaviour of rural households is pertinent for understanding the constraints to agricultural growth.

Even though the country has been undertaking efforts to increase the inflow of external investment, agricultural production based on family farming is unlikely to grow only on the basis of inflow of such resources. In the agriculture sector, farm households' personal savings provide a major source of investible resources. Since the corporate and government sectors do not offer a bright prospect of achieving a substantially higher rate of savings, household savings will continue to be a major component of overall domestic savings in the country. Rural households are likely to contribute a substantial part of such savings not only for being more numerous but also through their high saving propensities.

Moreover, an analysis of savings behaviour of rural households is pertinent because such savings and dissavings have important implications for the welfare of these households. Without access to institutional credit and insurance facilities, personal savings is the major source of finance in situations of crisis and emergencies requiring large unforeseen expenses.

The Household Expenditure Survey (HES) of the Bangladesh Bureau of Statistics (BBS) provides a major source of information on household savings. However, the reliability of estimates of savings from HES data is subject to serious criticism.. The main emphasis of HES is

to provide data on expenditure and the estimates of income generated by HES have shortcomings due to several sources of underestimation. Therefore, HES data contain an underestimation of savings (obtained as income minus consumption expenditure) which stands at 6 per cent according to 1995-96 HES[1]. The last three HES provides savings data which yield a declining average rate of savings which is considered implausible, given the efforts at mobilization of savings and the steady growth of GDP. Such inadequacy in national level savings data calls for alternative estimates which may supplement HES information. Moreover, HES does not have the scope for provision of in-depth insights into the determinants of savings. A survey based study, as the present one, may supplement the national findings and provide a more indepth analysis of factors which determine savings.

In the absence of availability of detailed data on savings behaviour and its determinants, some of the early studies on savings used HES data (e.g. Chowdhury 1987) and obtained estimates of average and marginal savings propensities.[2] Such estimates have limited usefulness since, in addition to the problems with quality, the results are based on an analysis of grouped data.

During the last ten years, no specific study has been undertaken on savings behaviour of the rural households. Some studies focussing on other aspects of the rural economy contain partial analysis of household savings (Ahmed & Hossain 1990, Sen 1996). However, these studies seem to have left many questions unanswered requiring further analysis. Most of the studies also do not look into the question of investment as it relates to the agriculture sector and its growth (Alamgir et. al. 1974, Chowdhury 1987, Rahman 1998c). This suggests the need for an in-depth analysis of various aspects of rural savings and investment and for estimation of national savings rate on the basis of a large sample which is attempted in the present study[3].

1.2 Objectives and scope of the study

The objective of the present study is to provide an analysis of the savings rate of rural households and examine their investment pattern to suggest appropriate measures to accelerate agricultural development in Bangladesh.

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1 The latest round of HES did not provide the savings estimates explicitly. BBS considers that the income minus consumption expenditure method may not provide a reliable estimate of savings unless a separate income module is administered.

2 One of the earlier studies on saving based on survey data from two villages provides some useful insights into capital formation and surplus generation for agriculture (Rahman 1978). But the analysis of household saving of the study is limited since it did not consider non-farm investment as a component of saving.

3 The only study focusing on investment in agriculture was conducted in the late 1970s based on a sample of two villages (Rahman 1980). The study is beset with many conceptual problems: for example, `surplus' is defined to include only agricultural investment with the exclusion of non-farm investment.

Chapter 2 examines the national estimates of the rural savings rate using alternative concepts of savings. The chapter also examines the determinants of household savings propensities. Chapter 3 attempts to provide a closer investigation of the interface between poverty and savings. The reflection of poverty in the incidence of crisis and the role of savings in management of such unforeseen distress have been given a special focus. Chapters 4 and 5 focus on the issues of farm investment. While Chapter 4 examines the accumulation of fixed capital through household investments, Chapter 5 deals with the use of current capital in agriculture, specifically in the crop sector. Chapter 6 examines the savings behaviour of female headed households and focuses on the gender issues related to savings. Chapter 7 provides some concluding observations and summarizes the major findings.

1.3 Data sources

The major source of data for the present study is the rural poverty monitoring surveys (PMS) conducted by the Bangladesh Bureau of Statistics (BBS) in the month of April of 1996 and 19974. The sample for the surveys is based on the Integrated Multi-purpose Survey Design, adopted by the BBS for conducting its major surveys. For the poverty surveys in the rural areas, a sample of 110 Primary Sampling Units (PSUs) are selected at the first stage. The PSUs are clusters of households with 250 households on the average. The spatial distribution of the sample PSUs is shown in Annex 1. In the second stage of sampling, 30 households are chosen randomly from each of the selected PSUs. Thus a total of 3,300 households constitute the sample of the surveys.

In addition to the poverty surveys, some village level information for the study were collected through a supplementary survey conducted in May 1998. This survey collected data on development activities and farm investment along with some general characteristics of the villages (e.g. distance from utilities, availability of infrastructure, irrigated area and others).

In addition to these sources, secondary information on relevant issues have been presented in appropriate contexts. Source of secondary information is the source of data for all other tables.

[4] The poverty monitoring surveys are carried out by the BBS with assistance from the Monitoring Adjustment and Poverty (MAP) Project of CIRDAP.

Chapter 2

Estimates and Determinants

2.1 Introduction

As a concept, household savings is relatively simple which is defined as the difference between current income and current consumption expenditure. In a monetized economy, where both income and consumption take place in monetized form, the concept can be easily used to obtain accurate estimates of household savings. However, in the rural areas of developing countries like Bangladesh, most households undertake production at least partly for domestic consumption and a large part of both income and consumption take non-monetized forms. In such a situation, the definition and calculation of household savings are beset with problems of conceptualization as well as of measurement. Since savings is defined as the difference between income and consumption, such problems in both the areas deserve attention.

Apparently the identification and measurement of essential consumption items do not involve much complicacy. In this context, one source of controversy arises if one recognizes the fact that, for the segment of the population with low nutritional status and with consumption levels below the subsistence level, the distinction between consumption and investment expenditures becomes somewhat arbitrary. This becomes especially relevant due to increasing emphasis on the role of human capital in development and the recognition of expenditure on items like education as `investment in human capital'. An equivalent approach would require that the inputs of consumption which lead to improvement in human physical capacity be treated as investment. However, the demarcation of the minimum nutritional level below which consumption should be treated as investment is rather difficult to set. Hence, the present analysis does not attempt to resolve such conceptual difficulties and continues to follow the traditional approach. Within the traditional framework, the proposition that expenditure on human capital is a form of investment is not explicitly recognized in arriving at estimates of savings and other macro-accounts. In recognition of the need for treating such expenditures as a component of savings, two concepts of consumption expenditure have been used in the present study to obtain alternative measures of household savings e.g. total consumption expenditure; and consumption expenditure excluding expenditures on education and health care.

The differences between income and the two alternative measures of consumption provide two estimates of savings which may be defined as

- Net savings (s) as measured under the traditional concept; and

- Net savings including investment in human capital (shc).

The present study employs current estimates of income flows at the household level to arrive at the adopted measures of savings. An alternative method is available but it could not be used due to difficulties in generating the required data. This involves the use of balance sheets to determine the changes in the net worth of the household's physical and financial assets. The method requires information on several dimensions of changes in the financial status of the households e.g. net acquisition of physical assets, net acquisition of financial assets, changes in financial liabilities (e.g. loans) and net capital transfer (inflow and outflow). It is difficult to generate these information for the rural households especially those on financial assets. The method, however, has the advantage of providing not only an estimate of household savings but also a breakdown of the use of such savings.

Though the advantages of the balance sheet method is often emphasized, such estimates, however, do not permit alternative conceptualization of savings as is done in the present study. Moreover, the use of the balance sheet approach does not obviate the need for estimation of income since a major objective of the analysis of savings is to relate it to current income and to obtain estimates of savings propensities. The current account approach to the measurement of savings is also theoretically more logical when the saving propensities (with respect to income) are calculated since the method satisfies the basic identity that savings is the residual of income over consumption ($S = Y - C$). Though the present study does not explicitly use the balance sheet method for estimating savings, the data on net acquisition of physical assets has been generated to shed some light on the nature and extent of capital formation by the rural households. The estimates also reflect the households' preferences over portfolio choice in terms of investment in physical assets and financial savings. In this context, the composition and structure of savings have also been studied since the level and structure of savings may be subject to disparate factors. The determinants of each are important to recognise separately for policy purposes.

At this point, it may be useful to mention that household savings have been traditionally classified into three types: voluntary savings, compulsory savings and contractual savings. Contractual savings include various types of insurance, time deposits and similar other forms. Compulsory savings may be generated by the government in times of emergency e.g. war, natural calamities and during post-war reconstruction phase. These are, however, exceptional cases. Compulsory savings may also take place within pension, provident fund and similar other schemes. In the context of the rural society of Bangladesh, however, the above two forms of savings are not common and savings are essentially voluntary.

2.2 Estimates of savings rate

The estimates of the savings rate and its various correlates are presented in this section. Both the definitions, as presented above, are used to provide alternative estimates of the savings rate. As indicated earlier, the estimates are based on data from a sample of 3,300 households which is nationally representative and may, therefore, be considered as national rural savings rates. Savings rate used in this section is defined as the `ratio of total savings of all households to the total income of those households' (the households may include the total sample or sub-groups from the sample).

The savings rate (s) in the rural areas stands at 16.3 per cent of the rural income (Table 2.1). A large per centage of this savings comes from the higher income groups. The savings rate in the two highest income groups are 24 per cent and 51 per cent respectively. In the income group just above the poverty line (which is Taka 2400 per month), the savings rate is close to zero. In the two lowest income groups, net dissaving is observed. .

Table 2.1: Gross savings rate of rural households in different income groups

Household income group (Taka/month)	*Number of households*	*Monthly income per household (Tk) (Y)*	*Monthly saving per household (Tk) (S)*	*Per centage of income saved* $\frac{S*100}{Y}$
0 - 1440	838	953	-706	-74.08
1441 - 2400	923	1899	-355	-18.69
2401 - 3600	644	2947	25	0.85
3601 - 4800	291	4175	331	7.93
4801 - 7200	286	5834	1422	24.37
7201 +	318	14283	7350	51.46
All groups	3300	3599	587	16.31

These values of savings have been obtained as net of the positive and negative savings within each income group. There are positive and negative savers among all the income groups. High income groups have fewer negative savers and, therefore, net savings rate is positive while, the reverse is true of the lower income groups. The issue is further examined in Chapter 3.

The savings rate including investment in human capital (shc) is shown in Table 2.2. The gross shc rate is 19.7 per cent which is about 3.4 per cent higher than the traditional savings rate. This indicates that human capital formation accounts for 3.4 per cent of total rural income.

Table 2.2: Gross saving rate based on extended definition

Household income group (Taka/month)	*Monthly income per household (Taka) Y*	*Monthly savings including human capital (Taka) S*	*Per centage of savings (extended definition) S*100 / Y*
0-1440	953	-664	-69.67
1441-2400	1899	292	-15.38
2401-3600	2947	126	4.27
3601-4800	4175	493	11.81
4801-7200	5834	1645	28.20
7201+	14283	7771	54.41
All groups	3599	709	19.70

In order to examine the correlates of the savings rates, disaggregated analysis of savings among various landownership and occupation groups is relevant for the rural areas of Bangladesh. It is observed that the relationship of savings rate with landownership of the households is not as strong as with income (Table 2.3). The savings rate is positive even among the low landowning groups and is similar for the medium landownership groups (1.00 to 1.99 acres and 2.00 to 4.99 acres). This is a reflection of the fact that income is the predominant determinant of savings and landownership accounts for less than half of the income for most households.

Table 2.3: Household savings rate by landowning groups

Agricultural land owned (acres)	*Number of households*	*Monthly income per household (Tk) (Y)*	*Monthly saving per household (Tk) (S)*	*Per cent of income saved (S*100)/Y*
0	1389	2201	14	0.64
.01 - .49	572	2767	110	3.98
.50 - .99	347	3335	414	12.41
1.00 - 1.99	456	4019	564	14.03
2.00 - 4.99	388	5618	1209	21.52
5.00 & above	148	13964	6642	47.57
All groups	3300	3599	587	16.31

In the case of various occupation groups, the savings rates are low among landless agricultural labourers and those engaged in other agriculture and as transport labourer (Table 2.4). These occupation groups also have low income. In this context, it may be worthwhile to examine the differential gross savings rates of households in terms of education levels of the heads of the households. The educational background of the head of the households could have implications on savings behaviour. The data presented in Tables 2.5, 2.6 and 2.7 do not reveal any discernible

trends. Table 2.8 presents the savings rates among different age groups of the heads of households, which show a negative relationship of savings with age of heads of households.

Table 2.4: Household savings rate by occupation of the head of household

Occupation of household head	*Number of household*	*Monthly income per household (Tk)*	*Monthly saving per household (Tk)*	*Savings as per cent of income*
Own farming	400	6786	2081	30.67
Own farming and tenant	480	3699	414	11.19
Tenant	47	2605	334	12.82
Unpaid family farming	64	3739	143	3.82
Landless agriculture labour	624	1937	-30	-1.55
Landownership agriculture labour	509	3470	888	25.59
Fisherman	54	2686	-235	-8.75
Other agriculture	38	1714	-382	-22.29
Trade	390	3602	369	10.24
Trans. prod. labour	138	2565	-16	-0.62
Salaried job	222	5466	1289	23.58
Other non-agriculture	334	2595	140	5.39
All groups	3300	3599	587	16.31

Table 2.5: Savings rate of households by education of head of households

Household income group (Taka/month)	*Monthly saving as per cent of monthly income* *Education of head*			
	No education	*I-V*	*VI-IX*	*S.S.C+*
0 – 1440	-61.54	-93.53	-123.79	-156.01
1441 – 2400	-10.99	-24.43	-31.34	-96.98
2401 – 3600	4.03	-0.99	-2.07	-9.87
3601 – 4800	7.94	11.14	4.19	4.22
4801 – 7200	31.86	24.05	14.91	21.16
7201 +	45.07	44.81	65.29	50.04
All groups	8.36	10.20	33.06	29.43

Table 2.6: Savings rate including human capital as savings by income group

Household income group (Taka/month)	*Saving including hc as per cent of income* *Education of head*			
	No education	*I-V*	*VI-IX*	*S.S.C+*
0 – 1440	-57.74	-88.73	-114.32	-147.61
1441 - 2400	-8.55	-19.95	-26.15	-89.03
2401 - 3600	6.35	2.82	3.11	-3.33
3601 - 4800	10.66	14.95	10.81	9.54
4801 - 7200	34.38	27.80	19.59	26.54
7201 +	47.36	48.13	67.80	54.11
All groups	10.89	14.03	36.94	34.21

Table 2.7: Difference between saving rates including and without human capital

Household income group (Taka/month)	*Education of head*				
	No education	*I-V*	*VI-IX*	*S.S.C+*	*All group*
0 - 1440	3.80	4.80	9.47	8.40	4.41
1441 - 2400	2.44	4.48	5.19	7.95	3.31
2401 - 3600	2.32	3.81	5.18	6.54	3.42
3601 – 4800	2.72	3.81	6.62	5.32	3.88
4801 – 7200	2.52	3.75	4.68	5.38	3.83
7201 +	2.29	3.32	2.51	4.07	2.95
All groups	2.53	3.83	3.88	4.78	3.39

Table 2.8: Household savings rate by age of head of household and income groups

Age of household head (years)	*Monthly saving as per cent of monthly income* *Household income group (Taka/month)*		
	0-2400	*2401 & above*	*All households*
< 21	-29.65	30.29	7.78
21 - 30	-21.65	26.35	7.26
31 - 40	32.14	37.00	18.09
41 - 50	-47.99	25.28	12.35
51 - 60	-47.43	28.05	17.23
61 +	-37.91	33.58	23.59
All groups	-36.02	30.64	16.31

2.3 Savings rates from HES data

It is of interest to compare the above estimates of rural savings rate with other relevant estimates. The only other large scale survey which presents findings on both income and expenditure is the Household Expenditure Survey (HES). The 1995-96 HES provides information on savings rate which is presented in Table 2.9. Two features stand out from the information:

Table 2.9: HES data on monthly household income and savings in the rural areas, 1981-82 to 1995-96

Year	*Income (Y)*	*Cons. exp. (C)*	*Savings = (Y-C)*	*$\frac{(Y-C)}{Y}$ x100*
1981-82	1082	991	91	8.4
1983-84	1844	1612	232	12.6
1985-86	2413	2157	256	10.6
1988-89	2670	2374	296	11.1
1991-92	3109	2690	419	13.5
1995-96	3658	3426	232	6.3

Source: BBS (1998), BBS (1993).

i) The savings rate is much lower than the rate obtained in the present study (6.3 per cent compared to 16.3 per cent); and

ii) The savings rate shows fluctuations over time. It declined during 1984 to 1989, increased in 1992 but declined drastically in 1996.

The second feature is somewhat difficult to explain particularly when placed in the context of trends in domestic investment. The per capita income has increased consistently over the last two decades. The usual hypothesis of positive marginal propensity to save (MPS) and its value being larger that the average propensity to save (APS), however, is not borne out by the HES data on savings which shows a fluctuating relationship between savings and income (Figure 1). The HES savings-income relationship is shown by MN.

A traditional savings function will have a slope less than the 45^0 line and will have a negative intercept term, as shown by the line QR which represents the savings function obtained in the present study.

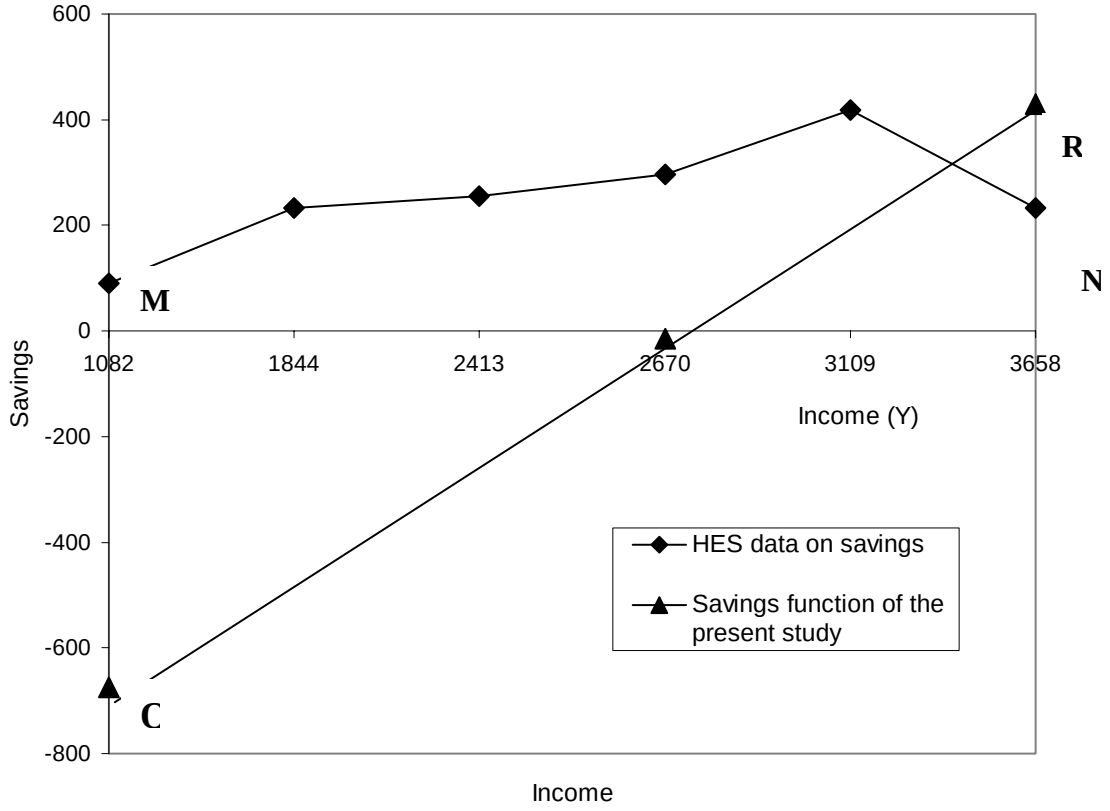
Between 1986 to 1992, there has been an increasing trend in the savings rate. In 1991-92, it was close to the present estimate, 13.5 per cent and if the rising trend continued, the estimated rate of the present study would be achieved. Although there has been no drastic change in

R

N

policies in 1995-96, the savings rate is about half of the previous year. The estimates of investment, however, do not reveal any concomitant decline (Mahmud 1998). Thus there seems to exist no a priori reason for savings rate to decline, nor is there any supporting evidence from other sources of data.

Figure 1: Savings from HES data and savings function from the present study



2.4 Determinants of household savings: theories and hypothesis

So far we presented data on some possible correlates of household savings. In this section, the existing theories on determinants of savings will be examined to arrive at hypotheses which may be tested through regression analysis. The theoretical reasonings suggest two major groups of variables which influence household savings. The first one relates to income and its various components while the second consists of factors which, directly and indirectly, affect the rates of return to savings. In order to identify the nature of the influence, various theories have been put forward which postulate different forms of relationship between savings, income, rate of interest and other variables. A review of the relevant empirical results, especially from studies on Bangladesh and other developing countries, may be useful in formulating the hypothesis of the present study. A number of recent studies have also included household characteristics among the variables which represent the determinants of savings. A consistent theoretical interpretation

of such variables may be offered in terms of the second set of factors, as mentioned above.

2.4.1 Absolute income hypothesis

The initial formulation of savings-income relationship originates from the works of Keynes. The absolute income hypothesis, as suggested by Keynes, provides a basis for the savings-income relationship which has undergone further developments over the years. The most important among these are the `Permanent Income Hypothesis' and the `Life Cycle Hypothesis'. Nevertheless, the elementary version of the Keynesian savings-income relationship still dominates the analysis of the determinants of savings. The basic Keynesian hypothesis postulates that:

i) absolute income is the most significant (or only significant) determinant of household savings; and

ii) The savings function will have a negative intercept term and a marginal propensity to save (MPS) greater than the average propensity to save (APS).

Since its formulation, a voluminous literature has emerged on the rationale behind this relationship and possible modifications. Numerous empirical applications, at both micro and macro levels, not only examined the validity of the Keynesian hypothesis but also enriched the specification and measurement issues. The cross-sectional investigation of savings - income relationship mostly arrived at results which supported the basic hypothesis. A number of studies in India and Bangladesh lent strong support to the Keynesian view. These studies obtained MPS in the range of +0.20 to + 0.50 and negative intercept terms (Chowdhury 1987, Nandal 1972, Pandey et. Al. 1972, Rai et. Al. 1972, Ahmed and Hossain 1990).

In contrast, a number of studies based on time series data from both industrial and developing countries refuted the Keynesian specification. These studies mostly arrived at a proportional relationship between savings and income (e.g. Mikesell and Zinser 1973, Houthakker 1965, Johnson and Chiu 1968). Therefore, the enthusiasm about the Keynesian hypothesis gave way to alternative formulations.

2.4.2 Permanent income hypothesis

As the simple absolute income hypothesis was refuted by a number of studies, theorizing proceeded through formulation of more complex relationships between savings and income. The most celebrated among these is Friedman's permanent income hypothesis (PIH). The PIH

distinguishes between two components of income: the permanent income (defined in terms of long run expectations) and transitory income. The former is considered as the major factor influencing consumer spending. A large part of the latter is likely to be saved. Thus if savings-income relationship is estimated separately for these two components, the latter will have higher MPS. In its most simple form, the equation representing the PIH is:

$$S_t = a_o + a_1 Yp_t + a_2 YT_t$$

where S_t is savings in year t and Yp_t and YT_t are permanent and transitory income respectively during the period. The permanent income is often measured by taking a moving average of two to four years (depending on data availability and other considerations). The hypothesis was formulated in the context of the US economy and a number of its variations have been suggested and used successfully in empirical estimation.

A major criticism behind the applicability of the hypothesis in the context of developing countries centers around the problem of formation of rational expectations. In general, instability in income along with market rigidities tends to create an environment where the decision making horizon is usually short in the developing countries. Moreover, in countries like Bangladesh, where average income is low and a large per centage of households live close to a subsistence level, transitory income may be used to improve the standard of living or to smooth out consumption. In contrast, there may also exist forces, which operate in the reverse direction and lead to higher rate of savings out of transitory income. In a low income economy, and especially in the rural areas, the range of availability of non-essential consumption goods is small. Therefore, a high proportion of transitory income may be saved and reinvested in economic activities currently pursued by such households. The lack of institutional support for old age and similar other considerations are also likely to encourage a high rate of savings from unexpected incomes. Which of the above forces will dominate, however, remains as an empirical issue. There are also doubts regarding the existence of a significant transitory component of income in such economies and, even if it exists, the problem of how it could be measured remains.

In India, the application of PIH provided contrasting results for rural and urban areas. In the rural areas, the hypothesis was borne out by the results but the reverse was obtained for urban savings. The results for other developing countries have also been mixed. The application of PIH in the case of Bangladesh is difficult not only due to measurement and conceptual problems, but also due to the lack of availability of a reliable time-series data on savings. The HES data are available for only six rounds (excluding the 1973-74 round which obtained unrealistic figures for savings). Moreover, the surveys have been conducted at irregular time intervals.

Though it may not be possible to use time series data to test the applicability of PIH in Bangladesh, the essence of the relationship may be used to test some relevant hypothesis on the basis of cross sectional data. For the purpose, one should identify the factors which create an unexpected positive shift in income. The injection of microcredit in the rural areas can be taken as a pertinent example. The expansion of microcredit, both by the government and the NGOs, helps the rural households to increase their income significantly. Such a shift in income may be considered as parallel to transitory income and its impact on savings could be examined. Similarly, remittances from abroad by migrant workers constitute a form of transitory income and this should result in higher MPS.

2.4.3 Life cycle hypothesis

The life cycle hypothesis (LCH) postulates another alternative relationship between savings and income. The hypothesis, associated with the contributions of Modigliani, Brumberg and Ando, assumes that the individuals consider their life time as the horizon over which they plan their consumption behaviour. In the process, they plan to attain no net savings but spread their consumption evenly over various phases of their life cycle. For the purpose, they accumulate savings during their earning periods and maintain the consumption level through dissaving during their retirement. The postulated behaviour leads to predictions about the determinants of individuals' savings and also the macro issues related to the savings capacity of a society. In the present context, the household level hypothesis, however, is relevant.

If the LCH holds, then in a society with stationary population and income, there will be no net savings in the aggregate. With a growing population and/or growing per capita income, savings will be positive. At the micro level, LCH implies a negative relationship between savings of individuals and their age. The household level data may be used to test the latter hypothesis in the context of rural areas of Bangladesh.

2.4.4 Returns to savings as a determinant of savings propensities

The factors which affect the returns to savings contain macro variables as well as those representing household characteristics. The latter set of variables includes factors which affect the economic returns to savings as well as factors which influence the value attached to savings.

Among the macro variables, the impact of the rate of interest on savings has been widely discussed. The importance attached to rate of interest has, to a certain extent, been due to its amenability to policies. Moreover, interest rate policies may not only influence the savings rate, but also have impact on the allocation of investment. The major thrust of the discussion on the

optimal interest rate policy and the relationship between rate of interest and savings rate especially with reference to the developing countries, however, concerns with the financial repression in these countries. It is argued that low and negative real rates of interest has often been at the root of the observed low savings and biased allocation of investment.

However, a priori reasoning and empirical evidence are not unanimous on the validity of the relationship. The impact of interest rate changes on savings involve both income and substitution effects, working in opposite directions. Each of these is influenced by a host of factors and, therefore, the relationship between savings and interest rate is rather complex. In the rural areas of a developing country like Bangladesh, the role of the rate of interest may not be pronounced. The low rate of monetized savings and a minor role of financial intermediation, reduces the importance of the role of interest rate as a determinant of savings.

A number of other factors may also influence the level and composition of savings through their impact on the returns to savings. These factors may be grouped into three major categories:

- household characteristics;
- characteristics of the infrastructure and availability of other services; and
- macroeconomic policy environment.

The important variables in the first category include the resource endowment of the households including human capital and other demographic characteristics. The demographic characteristics of a household (e.g. age of head of the household, dependency ratio, gender composition of members) are likely to affect the time preference of consumption as postulated by the life cycle hypothesis and thereby affect savings. In addition, such characteristics are important determinants of the type of economic activities pursued by a household which, in turn, determines the returns from savings.

The composition of resources of the households determines the sectoral composition of its employment and income. The composition of income in terms of sectoral origin, therefore, reflects the intersectoral differences in the rates of return from investment in various sectors. This set of factors may be incorporated directly in the analysis of determinants of savings. If the composition of income is used as explanatory variables, this could be interpreted as a representation of the rates of return, rather than as differences in the propensity to save out of income from different sources (Chowdhury 1987).

The human capital variables , namely, age and education may also influence the returns to

savings. These variables may influence a household's attitude towards the value of savings as well. The importance of age has been emphasized in the life cycle hypothesis of savings. Education is expected to exert a positive influence on savings through the creation of an awareness about the value of savings. The level of education also helps to increase the savings rate through its impact on returns to savings. In a developing country with low average level of education, it may be an important factor to encourage a higher level of liquid savings, especially with banks as it enables the households to observe the official procedures and formalities of the banking system.

2.5 Formulation of estimating equations

In the present study, simple linear Keynesian savings functions have been estimated which provide estimates of marginal saving propensities of the households. To test the influence of the returns to savings and other variables reflecting the attitude towards savings, multiple regression equation models are employed with household income and other variables as regressands.

Two concepts of savings have been used for estimating separate equations: one is the traditional concept (SAVE1) and the other includes investment on human capital (SAVE2). Thus we estimate the following equations:

Eq1. SAVE1 = f (income)

Eq2. SAVE2 = f (income)

Eq3. SAVE1 = f (all variables)

Eq4. SAVE2 = f (all variables)

While it is expected that income will be a major determinant of savings, a significant coefficient of income by itself does not necessarily reflect the superiority of the Keynesian hypothesis over other competing ones. A comparison of the explanatory power of equation 1 and equation 3, for instance, will reveal whether the Keynesian formulation may be considered as an acceptable hypothesis, and how far the other variables play significant roles.

In the fully specified equations, the considerations behind the inclusion of the variables are the following:

- Household income and household size are included as separate variables. Since income is considered at the household level, savings are also measured at the

household level. This helps to distinguish the impact of household size;

- Household head's attitude is represented by his/her age and years of education;
- Household's stock of assets may have implications for the rates of return to investment. The value of land and non-land assets have been included separately;
- Amount of credit from institutional sources usually enhances the income of the households and thereby influences savings. The amount of institutional credit is included separately. It is expected to act as a proxy for the presence of a transitory component of income.
- A household's per centage of income in the form of consumable commodities may lead to overconsumption of such commodity. This is likely to have a negative impact on savings. Therefore, a variable defined as `per cent of income in kind from agricultural production', has been included; and
- A dummy variable is used for households receiving remittances (those who receive such money is attached a value of one).

2.6 Savings and infrastructure

The relationship between savings and infrastructure development deserves special attention. This is because the latter is easily amenable to policies and may be developed through the direct intervention by the government. The beneficial development impact of infrastructure in Bangladesh has been emphasized in the context of income generation and poverty alleviation. It is, therefore, worth examining whether infrastructure facilities influence savings as well.

The development of infrastructure could influence savings in a number of ways. The indirect positive influence takes place through enhancement of income. As long as the propensity to save out of additional income is positive, infrastructure makes an indirect contribution to savings. There also exist other direct routes through which infrastructure development may raise savings. First, the access to transport facilities and the closeness to financial institutions offering savings facilities may raise savings through the provision of financial services. However, in the rural areas only a small number of households take the opportunity of such savings services and thus this direct impact may not be very large. Secondly, the physical infrastructure, in the form of roads, electricity, market place and other facilities may increase the scope for profitable investments and thereby increase the amount of investment expenditure of the households. Since a large part of rural savings takes the form of direct investment, this channel may act as an important mechanism for increasing investment.

To examine the independent impact of infrastructure after controlling for its indirect impact through income, a number of variables representing infrastructure have been analysed, in addition to income and other conventional variables. More specifically, four variables have been chosen to represent the level of development of infrastructure: the distance of a village from the bus stop, from the nearest branch of a bank, from the market centre and from source of electricity. The smaller the distance of each of these, the higher the development of infrastructure. These variables are, therefore, expected to have an inverse relationship with the amount of savings.

2.7 Estimates of the savings functions

For estimating the savings equations, the outlier values of the sample, e.g. 5 per cent from the upper and lower ends have been excluded. The practice is followed in other estimates of savings functions as well (Ahmed and Hossain 1990, Sen 1996). The rationale is that the extreme values of savings and dissavings take place due to unexpected earnings or unforeseen large expenditures arising from unusual circumstances. Such savings/dissavings may not be considered as a deliberate choice and would not be amenable to policies for savings mobilization.

The results of the estimation of the Keynesian savings function are given in Table 2.10. The estimated coefficients and the constant term conforms to the Keynesian hypothesis of MPS as less than one and the APS being less than MPS (the intercept term being negative). The value of MPS is 0.45 and the regression coefficients are highly significant. The value of adjusted R-square is not very high (0.25) but in a cross-sectional data set, the value is in the acceptable range.

Table 2.10: Results of Keynesian Savings Function (OLS regression) Dependent variable; household savings

Explanatory variables		*Coefficient*	*Value of `t'*
Household income		.45	31.72***
Constant		-1217.02	-24.47***
Adjusted R-square	= 0.25		
Value of F	= 1006.39***		
Sample size	= 2970		

Note:, **, *** denotes significant at 0.10, 0.05, 0.01 probability level respectively.*

It is useful to compare the findings on MPS with results obtained from similar studies in Bangladesh. Among the studies, Chowdhury (1987), Ahmed and Hossain (1990) and Sen (1996) may be mentioned. Chowdhury (1987) used the group data from the HES and regressed saving on income per household for 1977-78 and later rounds. For these years, the MPS ranges between 0.23 and 0.19 for the rural areas. The figures are lower than the estimates of the present study. This is somewhat expected, as it has been mentioned that HES provides underestimation of savings. Moroever, during the period, the MPS might have been low due to the extremely low level of development of the rural economy. Alamgir and Rahman (1974) obtained a low value of MPS (0.11) by regressing per capita rural savings on per capita income. Ahmed and Hossain (1990) provides estimates of MPS in the range of 0.34 to 0.42. These values are close to the values obtained in the present study. Sen (1996) arrives at a very low MPS because of low savings derived from the investment account.

An alternative form of savings function, including the individual and household characteristics which may influence the returns to savings, has also been estimated. The rational for the inclusion of the variables in this equation have been discussed earlier. The results of the expanded savings function are presented in Table 2.11. The coefficient of income in this equation is higher than the simple equation. The `life cycle' variable represented by age of the head of households has a significant negative coefficient which is in conformity with our hypothesis. The coefficient of the amount of credit from institutional sources is not significant. The size of agricultural land owned has a negative coefficient. This is explained by the fact that the sale of land is an important means for financing dissavings. The per centage of income from crops has a negative coefficient. The number of household members has a negative coefficient as expected, as it exerts a pressure on consumption needs. Contrary to expectations, the years of schooling has a negative and significant coefficient which is difficult to explain. The dummy for receiving remittances has a positive but insignificant coefficient. Availability of infrastructural facilities have been included as explanatory variables in the extended savings function. Closeness of bank, `haat', bus linkage etc. are expected to increase the scope for savings. Access to irrigation and electricity are also

included. These factors are likely to increase income and thereby increase savings. But these factors also represent a modernization of economic activities and, therefore, may directly influence household savings. The coefficients of all the infrastructure variables except electricity are as expected. The value of adjusted R-square is much higher in this equation compared to the simple Keynesian formulation. The value of F is significant. Therefore, this formulation is considered an improvement over the simple Keynesian savings function.

Table 2.11: Household savings function with regressands including households characteristics and infrastructure facilities: results of OLS regression

Explanatory variable	*Dependent variable*	
	Coefficient	*t-value*
Age of head of household	-5.50	-2.88**
Credit from institutional sources	0.03	0.59
Land ownership	-54.58	-4.75***
Household income	0.65	44.65***
Number of household member	-295.61	-23.13***
Per cent of income from crop	-4.18	-5.17***
Whether receives remittance	4.46	0.08
Years of scheduling of head of hh	-52.99	-9.52***
Distance from bank	1.69	0.27
Distance from busstop	-25.36	-9.16***
Distance from electricity point	49.83	5.47***
Distance from market/haat	-31.42	-1.90*
Per cent of area irrigated	1.47	1.93*
Constant	381.16	3.52***
Value of F 169.41		
Adjusted R square 0.42		
Sample size 2970		

*Note: *,**,*** significant at 0.10, 0.05 and 0.01 probability level respectively.*

In the earlier discussion, the importance of human capital building as a form of savings has been emphasized. Therefore, a second extended savings function has been estimated where the dependent variable has been defined as `savings including human capital related expenditure'. The results are presented in Table 2.12. The explanatory variables are the same as the ones included in Table 2.11. The results of the equation are similar to those of Table 2.11 and do not require further discussion. Household, income has a higher coefficient compared to the equation in Table 2.11 as expected.

Table 2.12: Determinants of household savings defined to include investment on human capital

Explanatory variable	*Dependent variable*	
	Coefficient	*t-value*
Age of head of household	-4.27	-2.34**
Credit from institutional sources	0.04	0.77
Land ownership	-49.34	-4.51***
Household income	0.67	48.64***
Number of household member	-283.84	-23.34***
Per cent of income from crop	-4.02	-5.23***
Whether receives remittance	29.64	0.53
Years of scheduling of head of hh	-46.52	-8.22***
Distance from bank	3.41	0.58
Distance from busstop	-25.13	-9.55***
Distance from electricity point	46.59	5.37***
Distance from market/haat	-30.49	-1.93*
Per cent of area irrigated	1.46	2.02**
Constant	250.95	2.44**
Value of F 198.14 ***		
Adjusted R square 0.46		
Sample size 2970		

*Note: *,**,*** significant at 0.10, 0.05 and 0.01 probability level respectively.*

It is observed from the sample that a large per centage of households experienced dissaving. Therefore, a separate equation has been estimated to identify the factors associated with the practice of positive savings. The results are presented in Table 2.13. The explanatory variables included in the equation are: age and education of the household head, remittances, income, agricultural land owned, number of adult members and the number of dependent members in the households. The coefficients of age of the head, whether receives remittances and whether head of the household is male, are not significant. Other variables have the expected influence. Land ownership and education have negative significant coefficients which resembles the findings of the savings functions presented in Tables 2.11 and 2.12.

Table 2.13: Factors associated with households having positive savings': Results of logit regression

	Dep: whether a household has positive savings	
Explanatory variables	*Coefficient*	*Standard error*
Household income	0.0009	0.00004 ***
Number of adult members in household	-0.47	0.04 ***
Number of dependent members in household	-0.37	0.03 ***
Whether head of household is male (Yes=1)	-0.03	0.15
Land ownership	-0.18	0.03 ***
Education of head of household	-0.25	0.05 ***
Age of head of household	0.002	0.003
Whether received remittance money	0.006	0.10
Constant	0.19	0.22
Model Chi-square = 1137.44***		
-2 log likelihood = 3436.63		

*Note: *, ** … as in Table 2.12.*

Appendix Tables

Table A2.1: Savings rate of rural households by income group, 1996

Household income group (taka/ month)	*Monthly income per household (taka)*	*Monthly savings per household*	*Per cent of income saved*	*Number of households*
0-1440	907	-678	-74.75	964
1441-2400	1891	-277	-14.65	920
2401-3600	2947	118	4.00	559
3601-4800	4155	281	6.76	295
4801-7200	5916	1490	25.19	268
7201+	14059	7044	50.10	294
All groups	3396	515	15.16	3300

Table A2.2: Savings rate of rural households by land group, 1996

Agricultural land ownership (acres)	*Monthly income per household*	*Monthly savings per household*	*S*100 Y*
0	2071	-128	-6.18
.01 - .49	2630	103	3.92
.50 - .99	3282	486	14.81
1.00 - 1.99	3812	649	17.03
2.00 - 4.99	6486	2213	34.12
5.00 & above	10474	3720	35.52
All groups	3396	515	15.16

Table A2.3: Savings rate of rural households by level of education of head of household

Household income group (taka/ month)	*Education of head*											
	No eduction			*I-V*			*VI-IX*			*S.S.C+*		
	Average income (y) taka/ month	*Average saving (s) taka/ month*	*S*100 Y*	*Average income (y) taka/ month*	*Average saving (s) taka/ month*	*S*100 Y*	*Average income (y) taka/ month*	*Average saving (s) taka/ month*	*S*100 Y*	*Average income (y) taka/ month*	*Average saving (s) taka/ month*	*S*100 Y*
0-1440	931	-548	-58.86	820	-1038	-126.59	930	-1057	-113.66	789	-1009	-127.88
1441-2400	1877	-219	-11.67	1908	-377	-19.76	1941	-333	-17.16	1902	-779	-40.96
2401-3600	2920	120	4.11	2965	107	3.61	2963	159	5.37	3027	69	2.28
3601-4800	4126	214	5.19	4126	443	10.74	4263	742	17.41	4207	-351	-8.34
4801-7200	5902	1799	30.48	5952	1543	25.92	5948	978	16.44	5861	1398	23.85
7201+	16594	9469	57.06	13526	6705	49.57	10999	4742	43.11	12854	5172	40.24
All groups	2849	372	13.06	3638	547	15.04	4110	664	16.16	5789	1296	22.39

Table A2.4: Average saving propensity of households by income groups, 1996

Household income group (taka/month)	*Per cent of households with value of r=s*100/y*					
	<-10.01	*-10.00 to 0.01*	*0.00 to 10.00*	*10.01 to 20.00*	*20.01 & above*	*Total*
0 – 1440	64.63	9.75	9.02	5.91	10.68	100.00
1441 - 2400	39.13	12.83	14.89	13.37	19.78	100.00
2401 - 3600	24.15	9.66	13.60	14.49	38.10	100.00
3601 - 4800	20.00	5.76	9.49	12.20	52.54	100.00
4801 - 7200	8.96	5.22	8.96	6.72	70.15	100.00
7201 +	2.72	3.40	2.72	3.06	88.10	100.00
Total	36.64	9.30	10.91	9.82	33.33	100.00

Table A2.5: Savings rate including human capital as savings by education of head, 1996

Household income group (Taka/ month)	*Education of head*								
	No education		*I-V*		*VI-IX*		*S.S.C+*		*All group*
	Average shc	*Shc*100 Y*	*Average shc*	*Shc*100 Y*	*Average shc*	*Shc*100 Y*	*Average shc*	*Shc*100 Y*	*Shc*100 Y*
0 – 1440	-521	-55.96	-980	-119.51	-1003	-107.85	-643	-116.98	-67.47
1441 – 2400	-168	-8.95	-321	-16.82	-256	-13.19	-228	-31.34	-12.00
2401 – 3600	185	6.34	220	7.42	294	9.92	-217	8.82	7.36
3601 – 4800	341	8.26	613	14.86	915	21.46	460	0.81	11.02
4801 – 7200	1966	33.31	1844	30.98	1256	21.11	1739	29.19	29.78
7201 +	9684	58.36	7650	56.56	5051	45.92	7552	44.76	52.79
Total	436	15.30	739	20.31	824	20.05	640	28.07	17.78

Chapter 3

Poverty, Crisis and Savings

The conventional method of identification of the poor households is based on defining a cut off point in terms of minimum poverty threshold level of income or expenditure. The cut-off point may be defined using various methodologies and a proper methodology should be able to identify a threshold level such that households at this level are just able to meet their basic consumption/calorie needs. The households, with income/expenditure level just above the cut-off point, are expected to meet consumption requirements and their savings out of current income are likely to be small. Those households who fall below the cut off point are expected to run into deficit. Thus the notion of poverty implies an associated discontinuity in the savings capability. A continuous savings-income relationship, however, may not adequately capture this aspect.

The present chapter highlights the contrasts in the savings behaviour of the poor and the non-poor households and focus on the above mentioned discontinuity. A disaggregated analysis of the saving propensities of poor and non-poor households is also provided. However, the lack of savings among the poor should not be viewed as a mere feature of the statistical relationship between income and savings. This is linked to the survival of the poor households.

The dissavings among the poor households are financed through a variety of available options. Some of these may lead to disinvestment of productive assets and may impair the future productive capacity of the households. Hence, a deeper understanding of these mechanisms is pertinent for understanding the poverty dynamics. The dissaving behaviour of the households may also be associated with various types of crisis faced by the rural households that in turn may have differential impact for the poor and the non-poor households.

3.1 Negative savings and poverty

The analysis of the previous chapter highlights the relationship between income and savings and a strong positive relationship between the two along with a negative intercept of the savings function was obtained. Table 2.1 in the previous chapter shows that the rate of savings among the households in the two lowest income groups are negative. Since this average savings rate is computed for the group, a few extreme values of dissaving may result in a negative average rate. Therefore, to obtain insights into the pervasive nature of the dissaving behaviour, disaggregated picture is provided in Table 3.1. The table shows that

about 40 per cent of the households have negative savings with a value of APS (average propensity to save) of -10.00 per cent or less. Thus dissaving appears to be a pervasive feature for the groups. The value of the APS of each income group suggests that the extreme poor households with income below Tk. 1440 are extremely vulnerable; 80 per cent of the households in this group are involved in dissaving.

Table 3.1: Distribution of household income groups by savings rates

Household income (Tk/month)	*Per cent of households with value of r (= s/y *100)*					
	-10.01 & less	*-10.00 to -0.99*	*0.00 to 10.00*	*10.01 to 20.00*	*20.01 & above*	*Total*
0-1,440	70.53	9.06	7.85	5.68	6.88	100.0
1,441-2,400	45.16	11.10	13.41	10.55	19.78	100.0
2,401-3,600	28.41	12.40	13.66	13.34	32.18	100.0
3,604-4,800	22.07	5.52	10.69	12.41	49.31	100.0
4,801-7,200	12.28	6.32	8.77	10.53	62.11	100.0
7,201+	5.03	2.83	5.35	3.77	83.02	100.0
Total	39.50	9.12	10.62	9.36	31.40	100.0

3.2 Poverty, crisis and dissaving

The rural households are afflicted by various types of shock-events associated with natural disasters as well as social pressures (e.g. payment of dowry, major expenses on death or birth). Serious illness of family members, death or disability of earning members, loss of draught animal (due to theft or death) are among other sources of such crisis. The emergency situation created by such events may affect both the poor and the non-poor households. However, the implications of large unforeseen expenditure caused by such crisis are more serious for the poor households.

Most of these shock-events result in large and unforeseen expenditures. The poor households, in most cases, are not likely to meet such expenses out of current income and are forced to resort to various strategies for coping with the crisis. The coping strategies and the means of financing the crisis related expenditure differ across the poor households. Nevertheless, the implications of various types of crisis for saving/dissaving of the households are important in analysing the savings behaviour in the rural areas.

It has already been mentioned that the shock events may afflict both the poor and the non-poor households. It may be useful to start with an analysis of whether the incidence of crisis is of a random nature and whether the proportion of affected households are similar among the poor and the non-poor.

Table 3.2 provides information on the extent to which different groups of households are affected by such crises. It is observed that in the low income groups, about 9 per cent of the

households face some form of crisis. The per centages are similar for households with income upto Tk. 4,800 per month and thus there is no evidence that the poor households are more prone to such crisis events. Only in the two highest income groups, the per centage affected by crisis are smaller. The analysis on multiple incidence of crisis suggests that only a small per centage of households faced more than one crisis during the last one year. The average income of households who faced crisis and those who did not, within each income group are also very similar (except for the highest income group).

Table 3.2: Per centage of household in each income group affected by crisis

Household income (Taka/month)	*Average income of households*		*Whether faced crisis Per cent of households*		
	Facing crisis	*Not facing crisis*	*Yes*	*No*	*Total*
0-1,440	982	950	8.71	91.29	100.0
1,441-2,400	1858	1903	8.34	91.66	100.0
2,401-3,600	2931	2948	7.76	92.24	100.0
3,601-4,800	4136	4179	8.59	91.41	100.0
4,801-7,200	5773	5839	7.34	92.66	100.0
7,201+	10513	14563	6.92	93.08	100.0
Total	3049	3647	8.12	90.88	100.0

The responses to crisis events depend on the types of crisis faced. The distribution of the types of crisis faced by the poor and the non-poor households suggests that health related problems affect both the groups and account for the largest per centage of crisis (Table 3.3). The other types of crisis affecting a sizable number of households are: loss of crops, problems of river erosion and payment of dowry.

Table 3.3: Type of crisis afflicting rural households

Type of crisis	*Per cent facing each crisis among crisis affected households*	
	Poor	*Non-poor*
Death of main income earner	5.33	4.24
Large sale expenditure due to disease	38.00	34.75
Loss of crops	16.00	21.19
Eviction from land	4.00	4.24
Un-natural death of other earning member	0	1.69
Theft/dacoity	2.00	4.24
Theft of cattle	0	0.85
Death of bovine animals	0.67	4.24
Loss of property by natural calamities	2.67	1.69
Expenditure due to litigation	2.00	4.24
River erosion	15.33	3.39
Payment of dowry	4.00	6.78
Others	15.33	17.80
All	105.33	109.32

Note: Several households faced more than one crisis and, therefore, the total exceeds 100.

3.3 Impact of crisis on household savings

Even if the probability of being plagued by crisis events is similar for the poor and the non-poor households, the implications of such crisis are likely to be more serious for the poor households. Rahman (1996) uses the concept of income erosion to describe the economic pressures arising from crisis events. Income erosion consists of (i) direct losses (e.g., crop damage due to natural calamity) and (ii) expenditure which is linked to such events (e.g. court expenses for land litigation). While this is a useful concept for studying losses related to crisis, it may not reveal the indirect economic losses arising from a crisis. For example, income loss due to (i) foregoing employment opportunities (e.g. in case of sickness, bad weather, or litigation process) and (ii) lower productivity due to loss of productive assets (e.g. loss of draught animal may mean a loss of high paid wage employment for ploughing land) and similar other indirect costs should be added to income erosion to get a comprehensive picture of the costs associated with a crisis.

An alternative approach may be used to assess the economic pressure resulting from crisis events. The approach consists of a comparison of saving/dissaving among households with

and without crisis. It is expected that savings, defined as the difference between income and expenditure, would capture all direct and indirect impact of the crisis operating through both income and expenditure channels. Moreover, expenditure on some of the events described as crisis, may lead to curtailment of other non-essential expenditures. An analysis of the impact of crisis on savings will also take into account such balancing.

Table 3.4 examines the savings/dissaving behaviour of crisis affected households for both the poor and the non-poor categories and compares the results with households who are not affected. A clear negative impact of crisis on household's realized savings are observed. For almost all income groups, households affected by crisis show a much smaller savings rate or a higher dissaving rate (among the two lowest income groups) compared to households not affected by crisis. Similarly, Table 3.5 shows that, among the poor households, only 18 per cent faced with crisis are positive savers compared to 33 per cent among those who do not face crisis. The impact of crisis on savings of non-poor group is less glaring: 64 per cent and 73 per cent respectively among crisis affected and unaffected households are positive savers.

Table 3.4: Influence of crisis on household savings by income group

Household income (Taka/month)	*Monthly saving as per cent of monthly income*	
	None	*1 or more crisis*
0-1,440	-71.05	-104.68
1,441-2,400	-17.81	-29.14
2,401-3,600	1.70	0.48
3,601-4,800	8.57	6.61
4,801-7,200	23.89	30.50
7,201+	52.02	34.99
All groups	17.47	5.39

Table 3.5: Influence of crisis on savings of poor and non-poor households

Household income (Tk/month)	Whether faced one or more crisis	Per cent of household with value of r (=s/y *100)				
		-20.01 & below	-.01 to -20.0	0 to 20.0	20.01 & above	Total
0 - 2,400	Yes	60.67	20.67	12.00	6.67	100.0
	No	46.31	20.24	19.37	14.09	100.0
2,401 & above	Yes	22.88	13.56	20.34	43.22	100.0
	No	13.58	13.44	21.04	51.94	100.0

The implications of some of the crisis events, which affect relatively larger per centage of households, are examined in Table 3.6. Sickness of household members and dowry are observed to be the two main events. These events wipe off the surplus income of both the

poor and the non-poor households. Especially, the poor households suffer serious setbacks due to such a crisis. River erosion is found to affect the non-poor households more seriously.

Table 3.6: Influence of some major crisis on household savings

	Per cent of income saved by crisis affected households	
Type of crisis	*Poor*	*Non-poor*
Death of the main income earner	-49.76	42.51
Serious sickness	-88.64	14.54
Loss of crops	-35.08	16.80
River erosion	-20.22	-36.04
Payment of dowry	-105.91	5.95
No crisis	-43.17	17.61

3.4 Financing dissaving and crisis management

The households who are forced into dissaving resort to various mechanisms for financing the dissaving. The mechanism chosen to finance the dissaving of a household is likely to have implications for its future productive capacity. There are two major ways of financing the household budget deficit, namely, borrowing and spending out of accumulated past savings. Borrowing may again be classified into two broad categories: those with high interest rates and those without interest or with low rates as prevail among the formal credit institutions. Spending out of past savings may be viewed as disinvestment/sale of asset or as an expenditure out of cash saving. Table 3.7 provides the distribution of the mechanisms used by the poor and the non-poor households for managing the crises requiring large and/or unforeseen expenditure.

Table 3.7: Mechanism of crisis management among poor and non-poor households

	Per cent of households		
Mechanism	*Poor*	*Non-poor*	*Total*
From savings	5.7	15.5	10.1
Sale of land	10.1	11.6	10.8
Sale of permanent asset	2.5	8.5	5.2
Credit with high interest	15.2	10.1	12.9
Credit without interest/low interest	22.8	8.5	16.4
Organizational support from any society	6.3	0.8	3.8
Support from influential persons	7.0	5.4	6.3
Mortgage of land	5.7	12.5	8.7
Mortgage of permanent asset	0.6	0	0.3
Sale of cattle	4.4	6.2	5.2
Decomposition of household	0.6	2.3	1.4
Others	19.0	18.6	18.8
Total	100.0	100.0	100.0

Borrowing and dissaving in the form of sale of land are the two major mechanisms used by the poor households. Credit with high interests as well as credit from interest free or low interest sources also provide a major source of finance for these households. Seven and five per cent of the poor and the non-poor households during the crisis has also obtained support from influential village elite. A much larger per centage of the non-poor compared to the poor households depend on own savings and mortgage of land. The households choosing these strategies are less vulnerable since the land mortgaged out may be recovered in future and use of own savings not only saves them from interest payments but also from the obligations arising out of personal loans from friends and relatives and other forms of support from influential persons. Thus the poor households are locked in a circular pattern of crisis and dissaving. One way of breaking the chain is through the provision of credit with low rates of interest.

Chapter 4

Forms of Savings and Investment by Rural Households

4.1 Rationale for various Forms of Savings and Investment

The forms of household savings depend largely on the motive behind savings, which is guided by the existing asset base and investment portfolio. A household's decision to save is influenced by a number of considerations e.g.

- meet emergency consumption needs;
- make provision for foreseeable life-cycle expenses; and
- earn returns from the savings.

The form of savings which is suitable for the first or second objective, however, may not be the ones which fetch high returns. Therefore, a household is expected to strike a balance between various objectives through the choice of appropriate forms of savings.

In an economy with advanced financial markets, the choice of the forms of savings is relatively straightforward since a variety of savings services and financial instruments are offered by the financial institutions. In such an economy, the investment channels for the corporate sector are formalized with smoothly operating flow of information. In contrast, the rural households in Bangladesh have limited access to institutional saving services which could offer them with such a package of alternatives. In the absence of such services, savings decision of households depends, to a large extent, on overall production and consumption decisions. These are in turn influenced by the household's location within the system of production and by the operation of other markets. In developing countries like Bangladesh, market imperfections are pervasive and are not confined to only capital markets. Imperfections in other markets also influence investment and thereby savings decisions.

In the rural areas of Bangladesh, a large part of production is geared towards subsistence. The monetization of the economy is still limited and the progress is slow. The capital market is considered as the least developed among various markets. The financial institutions in general and the commercial banks in particular are also not motivated to serve the rural clients for various reasons. Moreover, the modality of operation of the formal financial institutions is not suitable for serving the illiterate rural clients. A number of other factors, e.g. high risk and high cost of operation of small loans and savings prevent the expansion of commercial banking services in the rural areas. The absence of saving services makes it risky

for the rural households to accumulate liquid savings. Therefore, the rural households develop certain practices to substitute for the provision for liquidity.

While the imperfections in the financial markets directly influence the savings decisions of the households, imperfections in other markets also have wide implications on the decisions on savings and the forms of savings. Such indirect influence takes place through their effect on the returns to savings put in different forms. For example, the conditions of markets for various products determine the profits from trading capital; and the development of physical infrastructure increases the profitability of investment in transport equipment.

In addition, there are various uncertainties and risks in the rural production system which are not covered by formal insurance. The existence of such uncertainties influences the savings decision. In the rural areas, economic uncertainties arise from the high dependence of agricultural production on the conditions of weather, which is aggravated by poor state of support services and informational rigidities. The weak performance of institutional support systems further reinforces these problems. Such uncertainties result in diversification of the sources of income and savings.

The labour market characteristics in the rural areas demonstrate certain peculiarities which also influence investment decisions. Wage labourers remain unemployed at least during the slack season. A large per centage of self-employed labour also remain underemployed and mostly do not opt for wage employment. Given the peculiarities in the labour market, there is an incentive for use of labour particularly during the slack period in expanding the productive capacity in family enterprises. Under such circumstances, savings may consist of income foregone due to allocation of family labour time away from earning incomes to the production of investment goods. Such direct investment of labour may take the form of land development, improvement of housing and storage capacity and similar other activities. Even the landless labourers, who possess few assets except the labour power, may store the surplus labour in the form of durable assets like improvement of house and care of the small poultry unit. However, the direct investment of labour may not be as large as is suggested by the proponents of this hypothesis. Not only the extent of surplus labour has been on the decline in the rural areas, the landless households are often so poor that they are forced to use their time in various expenditure saving activities (e.g. collecting vegetables, fruits, fuelwood) which supplement their present level of consumption from direct earnings. Moreover, they may have access to very little productive asset on which labour could be applied for further capital formation. Thus the quantification of such savings remains an important empirical question.

The imperfections in various markets result in a reduced flexibility in the transformation of

assets. Given such inflexibility, household choice is limited to the continuation of existing economic activities. The compulsion of continuity of economic activities leads to a pre-determined form of investment: the necessary implements in each activity must be acquired, which often embodies improved technology and must be acquired at a higher price. Thus the compulsion for direct investment may not only affect the form of investment but may determine the total investment as well.

4.2 Savings in direct investment of labour

The rationale behind the use of family labour for enhancement of the value of capital assets has been discussed in Section 4.1. While the PMS does not provide an estimate of such direct investment of labour, a recent study, based on a survey of two villages, suggests that the average value of such investment during a year has been Taka 238 which is about 8 per cent of total savings in these villages and is 0.8 per cent of total income (Rahman 1998c). Thus the omission of this component may lead to a slight underestimation of the national savings rate. However, such savings are not relevant for mobilization of savings in monetized forms.

The value of such investment, however, is small among the landless households. Even though landless households may possess surplus family labour, they mostly remain engaged in various expenditure saving activities e.g. gleaning and gathering activities for supplementing current consumption. Moreover, land improvement is the most important form of such investment and the landless households hardly have any scope for undertaking such an investment.

4.3 Investment in physical capital

For a particular household, agricultural productivity depends not only on farm investment, but also on its stock of capital (accumulated through investments over several years in the past). In this section, the stock of capital as well as the changes in the stock during the last one year (i.e. net investment) are examined. For the purpose, livestock has been considered as a separate category since some of the investment in this category may be directly used for crop production while a part of the investment consists of non-crop agricultural activity. The data on farm implements and machinery are presented separately.

It is observed that there is no significant change in the use of farm machinery between 1996 and 1997 though the total value of implements slightly increased (Tables 4.1 and 4.2). The number of households who owns traditional implements declined over the period. Households with ownership of power tillers, power pumps and shallow tubewells increased. In 1996, nine households owned deep tubewells (DTWs). In 1997 these DTWs remained non

-operational and none of the households purchased DTW.[5] On the aggregate, households with agricultural assets declined in 1997 compared to 1996. It is a matter of concern that the total value of farm assets is on the decline (by 0.8 per centage points), though the value of assets owned per household (those with positive value of assets) increased. It should be pointed out that the decline in total value of farm assets has been associated mainly with the decline in the value of two types of assets: DTWs and shallow tubewells (STWs). In fact, in 1997 all the DTWs were out of operation. The investment in STWs was negative, even though the number of STW owning households increased. This is due to the availability of STWs at lower prices. It is difficult to interpret this change since the STWs selling at lower prices may be poorer in quality.

Table 4.1 Ownership of farm assets among rural households

Type of asset	*Number of households*		*Per cent of households*	
	1996	*1997*	*1996*	*1997*
Plough/Moi/Spade	1432	1326	43.4	40.2
Power tillers	24	30	0.7	0.9
Power pumps	15	17	0.5	0.5
DTWs	9	0	0.3	-
STWs	116	142	3.5	4.3
Others	418	259	12.7	10.8
Own farm/asset	1567	1438	47.5	43.6

Table 4.2: Value of Farm assets owned by rural households

Type of asset	*Total value (Taka)*	
	1996	1997
Plough/Moi/spade	532,565	554,483
Power tillers	729,600	965,197
Pumps	293,500	212,980
Deep tube-wells	226,000	-
Shallow tube-wells	1871,630	1,798,572
Others	161,766	255,210
Total	3,817,984	3,786,220

[5] The non-operational DTWs have been assigned a zero value. This may lead to an underestimation of the value of agricultural assets because the machinery, even if non-operational, may sell for a small price.

Table 4.3: Types of assets owned by rural households

	Number of households	
Type of asset	1996	1997
Agricultural	1567	1438
	(47.48)	(43.58)
Livestock, poultry	2755	2757
	(83.48)	(83.55)
Fisheries	923	974
	(27.97)	(29.52)
Transport	870	940
	(26.36)	(28.48)
Others	2196	2114
	(66.55)	(64.06)
Total	3102	3064
	(94.00)	(92.85)

Note: Figures in parenthesis show the per cent of sample households.

From the data presented in Table 4.3, it is observed that the stock of other forms of capital increased during the period. The total value of transport, fisheries, and livestock assets increased by 15.1 per cent, 5.6 per cent, and 4.0 per cent respectively. Such increases have contributed to a net increase in the value of investment in these assets by about 5 per cent. The above account does not include investment in the trading sector for which data are not available. During recent years, however, investment in the sector seems to be increasing in the rural areas. A significant part of the savings of rural households is invested in housing and other related investment (e.g., drinking water). The valuation of such investment, however, is not available. Even after taking into account the investment in trading sector and in housing, a significant part of the savings may be lying idle or being used in informal money lending business. The financial sector should adopt policies for channelling such savings to the formal financial sector.

Tables 4.4 and 4.5 show the changes in various types of productive assets of households of various farm sizes. It is observed that the small and marginal farmers have undergone a process of decline in the holding of productive assets. The process is observed for both agricultural and non-agricultural assets. Such a process of negative changes in asset ownership has implications for productive capacity of the rural economy as well as for the poverty status of the households undergoing such declines.

Table 4.4: Change in total value of various types of farm asset

Name of asset	*Year/ per cent change*	*Farm size (acre)*							
		0	*0.01-0.49*	*0.50-0.99*	*1.00-1.99*	*2.00-4.99*	*5.00-7.49*	*7.50+*	*All*
Plough/moi/ Spade	*1996*	56,474	55,308	70,632	137,100	138,325	39,936	34,790	532,565
	1997	53,064	57,324	77,515	144,832	141,236	36,608	43,904	554,483
	Per cent change	-6.04	-1.69	9.74	5.64	2.10	-8.33	26.20	4.11
Power tillers	*1996*	-	200	-	52,000	182,196	213,198	281,995	729,589
	1997	45,000	100,000	15,000	25,300	276,397	106,000	397,500	965,197
	Per cent change	-	49,900	-	-51.35	51.70	-50.28	40.96	32.29
Pumps	*1996*	-	-	-	9,500	79,500	77,500	126,999	293,499
	1997	-	200	280	13,000	42,000	82,000	75,500	212,980
	Per cent Change	-	-	-	36.84	-47.17	5.81	-40.55	-27.43
Deep tube-wells	*1996*	-	-	12,000	26,000	108,000	-	80,000	226,000
	1997	-	-	-	-	-	-	-	-
	Per cent increase	-	-	-	-	-	-	-	-100.00
Shallow tubewell	*1996*	101,898	25,000	39,000	300,000	668,058	206,490	531,183	1871,629
	1997	58,032	71,500	58,905	255,507	629,408	345,989	379,300	1798,641
	Per cent change	-43.03	186.00	51.04	-14.83	-5.79	67.56	-28.59	-3.90
Others	*1996*	20,196	10,089	13,268	69,916	22,568	12,376	13,413	161,826
	1997	115,605	12,485	7,592	29,748	21,756	8,964	59,059	255,209
	Per cent change	472.42	23.75	-42.78	-57.45	-3.60	-27.57	340.31	57.70

Table 4.5: Change in the value of various types of productive assets by farm size

Name of asset	*Year/ per cent change*	*Farm size (acre)*							
		0	*0.01-0.49*	*0.50-0.99*	*1.00-1.99*	*2.00-4.99*	*5.00-7.49*	*7.50+*	*All*
Agriculture	*1996*	178,568	90,597	134,900	594,516	1,198,647	549,500	1,068,380	3,815,108
	1997	271,701	241,509	159,292	468,387	1,110,797	579,561	955,263	3,786,511
	Per cent change	52.15	166.57	18.08	-21.21	-7.33	5.47	-10.59	-0.75
Livestock	*1996*	4,020,765	2,247,696	1,342,900	174,5612	1,818,267	317,538	302,365	1,179,5143
	1997	3,974,950	2,051,775	1,588,878	200,8908	2,078,660	252,326	369,111	1,232,4608
	Per cent change	-1.14	-8.72	18.32	15.08	14.32	-20.54	22.07	4.49
Fisheries	*1996*	1,167,000	839097	525,474	689,440	857,550	176,456	222,740	4,477,757
	1997	1,142,664	698,418	614,601	841,645	1,040,195	141,000	249,696	4,728,219
	Per cent change	-2.09	16.77	16.96	22.08	21.30	-20.09	12.10	5.59
Transport	*1996*	897,022	567623	391,300	596,007	756,800	178,239	211,000	3,597,991
	1997	989,962	541,580	380,205	840,336	944,398	198,018	247,831	4,142,330
	Per cent change	10.36	-4.59	-2.84	40.99	24.79	11.10	17.46	15.13
Others	*1996*	295,7442	189,6580	1,140,210	148,5720	1709601	316,758	288,956	9795267
	1997	259,0619	150,4539	1,240,740	170,6468	1,920,793	304,876	369,999	9,638,034
	Per cent change	-12.40	-20.67	8.82	14.86	12.35	-3.75	28.05	-1.60

It is often hypothesized that remittances may improve the asset position of rural households. The pattern of asset ownership among the receivers of remittances and the non-receivers is presented in Table 4.6. An interesting feature which emerges from the data suggests that the remittance has a negative relationship with ownership of agricultural assets. The remittance is mostly invested in productive assets for non-farm activities. Among the medium and large landowners, the remittance receivers possess much larger amount of non-farm assets compared to those who do not receive any remittance.

Table 4.6: Value of asset owned by landownership groups and remittance receiving status

Farm size (acres)	*1997*							
	Remittance receivers				*Remittance non-receivers*			
	No. of house-holds	*Average value of farm asset*	*Average value of non-farm asset*	*Total produc-tive asset*	*No. of house-holds*	*Average value of farm asset*	*Average value of non-farm asset*	*Total produc-tive asset*
00	432	68	5,234	5,303	957	253	8,072	8,326
.01-.49	151	354	11,858	12,214	421	446	11,730	12,177
.50-.99	81	472	15,272	15,776	266	455	14,419	14,876
1.00-1.99	72	413	26,570	26,983	381	1,148	21,645	22,794
2.00-4.99	53	1526	41,314	42,841	223	3,075	29,491	32,567
5.00-7.49	16	3716	57,810	61,528	69	7,538	35,516	47,055
7.50+	3	8791	90,666	99,458	60	15,481	67,934	83,416
Total	811	393	13,101	13,495	2,489	1,393	16,645	18,038

Table 4.6: Continued

Farm size (acres)	*1996*							
	Remittance receivers				*Remittance non-receivers*			
	No. of house-holds	*Averge amount of farm asset*	*Average amount of non-farm asset*	*Total produ-ctive asset*	*No. of house-holds*	*Average amount of farm asset*	*Average amount of non-farm asset*	*Total produc-tive asset*
00	387	46	4,757	4,803	1,015	158	6,431	6,589
.01 - .49	135	108	9,232	9,340	428	184	10,588	10,772
.50 - .99	76	386	17,872	18,258	293	360	15,582	15,942
1.00 - 1.99	45	2,206	30,385	32,591	401	1,235	19,888	21,123
2.00 - 4.99	59	1,327	34,956	36,283	326	3,437	29,642	33,079
5.00 - 7.49	8	4,163	50,002	54,165	72	7,169	42,507	49,676
7.50+	7	1,175	69,361	70,536	48	22,087	61,383	83,470
Total	717	392	12,119	12,611	2,583	1,369	15,203	16,572

Moreover, a comparison of assets in 1996 and 1997 among the remittance receivers and non-receivers shows that, among the former group, the value of farm assets has remained unchanged, while the value of other assets has increased by 7 per cent. Among the non-receivers, the value of farm assets shows a marginal increase. Thus it is clear that remittances

are not usually invested in farm assets. Moreover, it is observed that remittances among the two smallest landowning groups do not have a positive impact on asset ownership. In these two groups, the receivers of remittances have smaller value of assets, compared to the non-receivers.

To examine whether the differences in asset ownership among farm size groups and among the receivers and non-receivers of remittances are statistically significant, a multiple regression analysis is used. In the analysis, an attempt has been made to identify the influence of other relevant factors along with farm size and remittances. Two regression equations have been estimated: one in which only farm implements and machinery have been defined as farm assets while in the second livestock have also been included in farm assets. Both equations give similar results. The results of the second equation are presented in Table 4.7 (the results of the first equation are presented in Appendix Table A.4.1).

Table 4.7: Determinants of farm assets including livestock: OLS regression

Explanatory variables	*Dependent variable*	
	Coefficient	*t-value*
Landownership	1752.85	24.23***
Non-crop income	0.07	1.90*
Whether receives remittances	-992.80	-2.11**
Adult male members in family	3041.05	14.53***
Whether male head (male=1)	640.29	0.86
Constant	198.59	0.27
Adjusted R square	0.26	
Sample size	3300	
Value of F	239.41**	

*Note:***, ** and * are significant at 0.01, 0.05 and 0.16 probability level respectively*

Among the explanatory variables, the amount of land owned by a household, its endowment of family labour, whether receiver of remittances, and the amount of non-crop income are included. It is expected that there is complementarity between the possession of farm assets and other resources which are used in farm production, namely, land and family labour. It is observed that an increase in the above two assets leads to an increase in the value of farm assets. As it has been mentioned, one may expect that the flow of remittances may have a positive impact on farm investment. However, this has been negated by the data. In fact, remittances have a negative impact on farm assets, and this is more significant when farm

asset is defined in a wider sense to include livestock. This may have two types of implications: first, those who send remittances belong to households who are less involved in agriculture. But this is not likely to be true since the regression controls for the size of farms. Therefore, the negative relationship is likely to suggest that those who receive remittances do not invest on farm assets. The gender of the head of household has been included as an explanatory variable to examine whether female headed households face a disadvantaged situation in this respect. This variable, however, turns out to be insignificant. Non-crop income has a significant positive coefficient. Thus there are complementarities between agricultural and non-agricultural activities.

4.4 Factors affecting investment on farm machinery[6]

In this section, the factors behind the lack of growth of farm investment, especially investment on irrigation equipment, are analysed. The uses of other items of modern farm machinery are not very common in Bangladesh. During recent years, power tillers are gaining popularity in some regions. Other large machines for land preparation or harvesting are unsuitable to the ecological characteristics and cropping practices in the country. Some of the factors, which are discussed with respect to irrigation equipment, may also be applicable to other investment items as well. The discussion on irrigation equipment focuses on DTWs and STWs. Most of the expansion of irrigated acreage during the last two decades has been achieved through the use of DTWs and STWs.

To understand the pattern of investment on irrigation equipment, it is worthwhile to take a closer look at the profitability of tubewell irrigation in the country. In the case of shallow and deep tubewells, the owners of the irrigation equipment enter into sales of irrigation services, even if they use the equipment for irrigating their own land. Therefore, the profitability of owning a STW or DTW is determined by the prospect of deriving a profit through the sale of water. Two contrasting views about the prospect of profitability of investment on tubewells relate to (i) monopoly pricing leading to higher water charges (higher than marginal cost of extracting water) and thus encouraging the installation of both DTWs and STWs, and (ii) monopoly profit may be curtailed by threat of competition from the prospective water sellers (new entrants into the water market) and the rate of profit may decline to a level which is too low to induce investments in tubewell irrigation. An attempt is made to examine how far these factors have contributed towards declining growth of investment on irrigation equipment in recent years.

In areas where the incidence of irrigation is low and competition of irrigation equipment

[6] Parts of this section draws from Shahabuddin and Rahman (1998)

from neighbouring areas is relatively absent, there exists ample scope for monopoly pricing. Adnan (1996) argues that `class contention' operating in the rural areas favours monopoly pricing. The argument centers around the bargaining power of the owners of irrigation equipment. On a priori ground, however, the higher bargaining power of water sellers is not so obvious as suggested by some of these studies. Once a farmer owns equipment, the farmer has no general choice but to sell water to recoup capital cost of the equipment. This is true even for a large farmer whose holding is big but the plots are fragmented and scattered over different places making his own land insufficient for utilizing the capacity of the tubewell. On the other hand, the prospective buyers of water has the choice of cultivating non-irrigated crops and/or crops with low water requirements even though they yield lower returns. The price elasticity of demand for irrigation services can thus be quite high.

The bargaining power of irrigation equipment owners, however, depends also on their socio-economic status. A commonly held view is that the owners of irrigation equipment are mostly large farmers. But a recent survey of the land ownership of those who own irrigation equipment reveals that a large per centage of the owners of both shallow and deep tubewells are small and medium farmers (IIMI 1995). Therefore, the hypothesis that the large farmers enjoy a virtual monopoly position with greater bargaining power may no longer be tenable.

It may be relevant here to review the findings on the profitability of STWs and DTWs from available studies. The empirical study carried out by Mondal (1989) indicates that the returns from HYV boro paddy cultivation using groundwater irrigation have declined both from the tubewell owners/managers and the water user's point of view. Moreover, the estimated level of net returns are too low to pay for the management services. The proximate factors underlying the fall in profitability of tubewell irrigation are related to the decline in the size of the command area and increase in costs of operation and maintenance. Moreover, reduction in yield and/or price of irrigated boro paddy affect directly those water sellers who receive payment in the form of crop share, and affect indirectly those who receive irrigation charges in the form of fixed cash per unit area. The average command areas of DTWs and STWs during the boro season declined by 26.3 and 11.2 per cent respectively between 1985 and 1988. This is because new tubewells have been installed in the vicinity of the existing ones, reducing the size of command area on the average.

Recently, Adnan (1996) has recomputed the returns from tubewell irrigation using data from Mondal's study. In particular, normalized per hectare figures have been used in the computation of the rates of return in order to control for the difference in size between DTW and STW command areas, and the fact that there exists a mix of diesel and electricity operated tubewells. According to these estimates, the rate of return of DTW operators is

observed to have declined from a phenomenal 164 per cent in 1985 to 46 per cent in 1988. For STW operators, the corresponding rate declined from 122 per cent to 75 per cent between 1985 and 1988. While the absolute magnitude of the rate was overestimated in all cases (mainly due to underestimation of costs resulting from omission of both interest and capital on working capital and annual adjustments in the capital costs of irrigation equipment), the relative decline over the three-year period is striking. The survey data from other parts of the country also show trends of declining profitability of irrigation during 1981-86 (Quasem, 1987). The factors contributing to the decline in the profitability of HYV boro cultivation using tubewell irrigation during the 1980s continued in the early and mid-1990s thereby posing constraints to the growth of irrigation during the period.

The possible contributions of hydrological, institutional and technological constraints adversely affecting the growth of irrigation in the country also deserve a closer attention. One of the formidable tasks for ensuring a sustained growth of agriculture is to improve the profitability of irrigated boro paddy through sustained increase in its yield. This would require continuous improvement in fertilizer use, soil management, agronomic practices, and plant protection measures. The tubewell owners/managers would need to improve their efficiency pertaining to on-farm water management in a competitive but regulated environment, so that the command area per machine is increased and cost of supplying water per unit of land is reduced. Another possible area of government policy intervention is to promote electrification of tubewells with uninterrupted/ regular power supplies so that operation and maintenance costs are reduced.

The other important services which deserve attention, are repair and maintenance. Following the withdrawal of Bangladesh Agricultural Development Corporation (BADC) from minor irrigation, a temporary vacuum has been created in the repair and maintenance of deep tubewells. In many areas, the private markets have not been able to provide adequate support services for operation and maintenance of DTWs. An appropriate programme needs to be put in place to provide support services (such as spare parts, mechanical workers, field equipment) to keep these wells operational until they reach the end of their expected lives.

There is a need for improvement of repair services in order to promote further development of irrigated agriculture. The minor irrigation development projects of the government have emphasized mainly on the installation of tubewells and paid little attention to the provision of support services. Many support services are underdeveloped (such as technical and aquifer information services, mechanical training) and credit is insufficiently accessible, both to the farmers as well as the equipment traders. As a result, research and extension of appropriate on-farm water management technology for efficient use of irrigation water for different crops

are mostly lacking. A large number of minor irrigation equipment are underutilized, and their discharge efficiency as well as overall water use efficiency is low. In this context, the government should give more attention to providing effective support to on farm water management, as well as the operation and maintenance aspects to enhance economic returns from groundwater irrigation (FAO, 1995). A recent study on privatization of minor irrigation has made a number of specific recommendations to improve support services in order to promote fuller development of minor irrigation sector in Bangladesh (IIMI 1995).

Findings from the above studies also indicate that the return to DTWs is much lower compared to the STWs. It will be useful to focus on the factors behind the low return to DTWs and the policy changes which have made this technology almost extinct. During the 1970s and early 1980s, most of the DTWs were owned by the Bangladesh Agricultural Development Corporation (BADC). Since the 1960s, the government had a monopoly in procurement and installation of DTWs. In mid-1970s, the responsibility of operation and maintenance was handed over to the farmers' cooperatives. The system continued till 1978/79 when the government decided to go for privatization of the BADC-owned irrigation equipment in stages. The success of the government controlled DTW irrigation system hinged around a number of restrictions on the expansion of STW irrigation. There was siting restrictions of STWs within a certain perimeter of a DTW; import restriction on STW machines -- private import of diesel engines for irrigation was not allowed except for specific makes and models approved by the Ministry of Agriculture. During the mid 1980s, the government started to accelerate policy reforms and trade liberalization under the structural adjustment programmes. In 1986, the government allowed the private sector import of any make and model of diesel engines. Siting restrictions on STWs were eliminated. The BADC owned DTWs were sold (at subsidized prices) to private individuals and to the cooperatives.

The DTWs in the private hands were initially profitable. But as soon as the restrictions on siting of STWs were removed, installation of STWs within the command areas of DTWs resulted in a shrinking of the area irrigated by a DTW and a decline in returns from DTWs. During the 1990s, the government removed all subsidies on the capital cost of DTWs. After the removal of subsidy, DTWs have become economically unviable. In fact, even with subsidy on capital costs, economic returns to DTWs are not sufficient to encourage the purchase of new DTWs. After removal of subsidy, the installation of DTWs has come to a virtual halt. Along with low returns to DTW irrigation, the competition from STWs has been a major problem for the expansion of DTW irrigation (IIMI 1995). Thus it is not surprising that in the present sample, the existing deep tubewells which were in operation in 1996, went out of order in 1997 and they were not repaired and reinstalled.

Before reaching a conclusion about the desirability of continuing DTW irrigation, two other pertinent questions deserve attention:

> First, whether there are areas where the groundwater situation is such that STWs are not suitable and DTW is the only suitable irrigation technology available; and
>
> Secondly, whether the low returns to DTWs are due to problems of cooperative (or private individual) management and whether there are alternative modes of organization of DTW irrigation which may lead to viability of the technology.

There are a significant number of thanas in Bangladesh which contain areas where only DTWs are technically feasible for extraction of sufficient water for growing HYV winter rice. Even in these areas, STWs may operate and provide irrigation for crops requiring less water. An emphasis on the national priority for growing foodgrains, especially rice, will require that DTWs are used in these regions. Recently some alternative technologies are being evolved in the form of deep-set and very deep-set STWs. However, a conclusive evidence is yet to be reached on whether these technological innovations may act as perfect substitutes of DTWs.

On the organizational aspects, there is no major scope for optimism about alternative forms of DTW ownership and/or management. A recent study shows that lack of profitability cannot be attributed to the problems of cooperative management (Rahman 1998a). The DTWs under both private and cooperative management suffer from low command area and lack of profitability. The DTWs owned by landless groups and NGOs also face insurmountable problems and most of these schemes have become non-operational.

In conclusion, it may be said that unless special schemes are undertaken by the government for the installation of DTWs, this technology will face extinction. The poor financial performance of DTWs, particularly in comparison to STWs and LLPs, dictates that in areas where STWs can operate, a phasing out of DTWs may be encouraged.

4.5 Savings in financial assets

In a monetized economy, most savings take place in the form of financial assets. The provision of financial intermediation and a wide range of savings services is a prerequisite for putting savings in the form of financial assets. Such preconditions do not exist in rural Bangladesh and hence few households are expected to save in these forms. It may be useful to examine how far people in the rural areas of Bangladesh save in financial assets and bank deposits.

Table 4.8 suggests that about 8 per cent of the household heads possess institutional savings in one form or other. Adding other members of the households, 365 persons report such savings. Assuming no two members of a household have savings in these forms, about 11 per cent households have such savings (the per centage could be lower since, in some households, there may be more than one member with such savings). Only 4 per cent of the households have savings accounts in banks. The group fund insurance is a compulsory form of saving for those who are in jobs with government or autonomous bodies and about one per cent of the households possess such savings. Thus it may be concluded that the access to institutional savings is rather limited among the rural households.

Table 4.8 Households who save in various forms of financial assets

(Per cent)

Type of saving	*Heads of household*	*Other members*
Bank saving	3.55 (117)	0.48 (16)
NGO saving	1.55 (51)	1.79 (59)
Group fund insurance	0.82 (27)	0.06 (2)
Life insurance	0.18 (6)	0.03 (1)
Share of company	0.30 (10)	0.06 (2)
Other investment	1.33 (44)	0.91 (30)

Note: Figures in parenthesis show the number of households

The lack of enthusiasm about the use of savings services of commercial banks is to some extent due to the lack of knowledge about these services. The commercial banks and even the specialized financial institutions do not undertake a conscious effort to mobilize savings of rural households which is reflected in the lack of awareness about the savings services provided by these institutions. A recent study on the use of savings services of commercial banks shows that a large per centage of rural households are unaware about the existence of such facilities (Table 4.9). Thus there is a case for taking up initiatives to increase such awareness.

Table 4.9: Awareness about commercial bank savings facilities

Awareness	*Per cent*	
	Male	*Female*
Full	31.2	9.7
Partial	43.6	15.5
None	25.2	74.9

Source: Rahman (1998b)

4.6 Investment on housing

An important form of investment in the rural areas consists of improvement in housing. In the conventional sense, consumer durables including housing may not be included in investment. But in the rural areas, housing conditions and sanitation and water supply situation are such that an improvement in these areas not only raises the standard of living, but helps to improve the health conditions and physical capability. These factors may, therefore, be viewed as contributing to human capital development.

Improvement in housing may make a direct contribution to the productive capacity of a household through its contribution to the productivity of family enterprises. For example, many of the processing activities in the rural areas use the living rooms for storage purposes. The kitchen, storehouses and cowsheds also make a direct contribution to economic activities. The changes in housing conditions resulting in an improvement may be considered as an investment, even if the value of such investment cannot be quantified. For this purpose, data from 1997 and 1996 surveys have been compared.

Table 4.10 shows that there is an improvement in housing conditions. The bed rooms and the kitchen are more important indicators of housing conditions. Drawing rooms in the rural areas are outhouse type of construction which is not usually used by the family members. Such rooms are found in the case of medium and large farmers' houses, where the male members of the family meet the people from outside. Considering the changes in bedroom and kitchen area, there has been a notable improvement in housing conditions between 1996 and 1997. There has been a 13 per cent increase in both bedroom area and kitchen area. The drawing room area has been more than doubled. However, only some households among the middle and large landowners own such rooms.

Table 4.10: Changes in the housing areas

Land ownership (acres)	*Average area (sq.ft)*						*per cent change*		
	Bed room		*Drawing room*		*Kitchen*		*Living room*	*Drawing room*	*Kitchen*
	1997	*1996*	*1997*	*1996*	*1997*	*1996*			
00	285	224	1	1	51	52	27.23	0	-1.92
.01- .49	252	258	1	1	84	71	-2.33	0	18.31
.50- .99	299	277	2	0	85	72	7.94	-	18.06
1.00-1.99	352	309	6	2	116	85	13.92	200.0	36.47
2.00-4.99	427	362	16	5	105	91	17.96	220.0	15.38
5.00-7.49	483	444	36	15	104	98	8.78	140.0	6.12
7.50+	670	786	35	23	121	113	-14.76	52.17	7.08
Total	319	280	5	2	78	69	13.93	150.0	13.04

An account of the areas, used for productive purposes directly, shows that there has been no significant improvement (Table 4.11). The cowshed area increased by 2.86 per cent and the storage area showed a decline. These findings point towards constraints in investment for farm activities. This is in conformity with the findings that direct investment on farm activities is on the decline.

Table 4.11: Changes in cowshed and store house area

Land ownership (acres)	*Average area (sq.ft)*				*per cent change*	
	Cowshed		*Store house*		*Cowshed*	*Store*
	1997	*1996*	*1997*	*1996*		
00	9	13	0	1	-30.77	-100.0
.01 - .49	21	26	2	2	-19.23	0
.50 - .99	39	39	2	1	0	100.0
1.00-1.99	62	53	5	7	16.98	28.57
2.00-4.99	90	74	14	17	21.62	-17.65
5.00-7.49	105	83	29	14	26.51	107.14
7.50+	151	124	54	66	21.77	-18.18
Total	36	35	5	6	2.86	-16.67

The source of drinking water and the type of toilet facilities available lead to improved health standards and expenditure on these items may thus be considered as investment. The data on investment expenditure on such facilities are not available. But the households' access to the facilities and the changes in access in 1997 compared to the previous year may be used as indicators of such investment. Table 4.12 shows that the access to tubewell water increased from 93 per cent in 1996 to 95 per cent in 1997. The data on the type of toilet do not suggest a uniform improvement (Table 4.13). Sanitary latrines were used by7.2 per cent and 6.3 per cent of the households respectively in 1996 and 1997. Contrary to such deterioration in the use of sanitary latrines, there has been an increase in the use of slab type latrines. In 1996 and 1997, 14.8 and 20.6 per cent of the households used this type of facilities. Thus overall there has been some investment on tubewell water and sanitation facilities, though the magnitude is not impressive.

Table 4.12: Sources of drinking water

Land ownership (acres)	*Sources*									
	per cent of households									
	Tubewell		*Well*		*Pond*		*River*		*Others*	
	1997	*1996*	*1997*	*1996*	*1997*	*1996*	*1997*	*1996*	*1997*	*1996*
00	93.81	92.22	3.31	3.74	1.44	2.74	1.22	0.79	0.22	0.50
.01 - .49	96.85	94.41	1.75	2.62	0.70	1.75	0.52	0.52	0.17	0.70
.50 - .99	96.54	92.80	1.44	2.31	1.15	2.88	0.86	2.02	0.00	0.00
1.00-1.99	94.30	94.30	1.75	2.41	1.32	1.10	2.41	1.32	0.22	0.88
2.00-4.99	95.88	91.24	2.58	4.90	0.77	2.84	0.77	0.52	0.00	0.52
5.00-7.49	97.65	95.29	1.18	3.53	0.00	1.18	1.18	0.00	0.00	0.00
7.50+	93.65	96.83	1.59	1.59	4.76	1.59	0.00	0.00	0.00	0.00
Total	95.03	93.00	2.45	3.30	1.21	2.30	1.15	0.88	0.15	0.52

Table 4.13: Type of toilet

Land ownership (acres)	*per cent of households*			
	Sanitary		*Slab*	
	1997	*1996*	*1997*	*1996*
00	3.24	5.11	14.83	10.30
.01-.49	4.20	5.24	18.18	12.24
.50-.99	3.75	4.03	20.17	16.71
1.00-1.99	7.46	7.46	26.32	18.86
2.00-4.99	14.69	13.92	30.93	23.45
5.00-7.49	18.82	20.00	41.18	24.71
7.50+	28.57	30.16	38.10	30.16
Total	6.27	7.24	20.58	14.79

Appendix Tables

Table A4.1:Determinants of the value of farm asset not including the value of livestock: Results of OLS regression

*Explanatory	*Dependent variable: farm asset excluding livestock*	
	Coefficient	*t-value*
Landownership	612.14	16.66***
Non-crop income	-0.003	-0.17
Whether receives remittance	-395.13	-1.65*
Adult male members in family	733.60	6.90***
Whether male head (male=1)	-193.57	-0.51
Constant	-353.15	-0.95
Adjusted R square	0.12	
Sample size	3300	
Value of F	89.05***	

*Note:*** and * are significant at 0.01, 0.16 probability level respectively.*

Chapter 5

Use of Agricultural Inputs

5.1 Input Use as Investment: Conceptual Issues

Investment on input use may be examined at two levels: (i) the aggregate or macro level and (ii) the household or micro level. The determinants of expenditure on input use at the macro and micro levels are expected to differ although there may be a set of overlapping factors. In this section, the pattern of expenditure on agricultural inputs at both macro and household levels are examined. The major objective is to identify the factors which influence such expenditure.

The expenditure on current inputs is not included in the traditional definition of investment. However, there is a need for widening the definition, especially for societies with significant agricultural production. In an agricultural production system based on family farming, investment in capital items is not quite common. Fertilizer and irrigation water are the productivity augmenting inputs in such systems. In contrast to industrial production, where the quantity of raw material use is not sufficiently flexible, agricultural input use has a greater degree of flexibility and a study of the variation of input use can be useful in identifying the constraints to agricultural growth. Moreover, in the context of agriculture, the expenditure on current inputs may act as a substitute for investment in fixed capital items. For example, a farmer may purchase a shallow tubewell (STW) for irrigating his/her land or may purchase irrigation water from other farmers who own the equipment, and this is considered as current input. However, both have positive impact on agricultural growth.

The recognition of expenditure on inputs as a form of investment raises a number of conceptual problems. If it is considered as an investment expenditure of a household, then it should be included in the household's savings as well. However, when one considers the mobilization of savings through services of financial institutions, the savings put in the form of investment on inputs will not be relevant, since it may not be available for any alternative use. Therefore, its inclusion in the calculation of savings rate may not serve a useful purpose though for the purpose of analysis of the prospects of agricultural growth, expenditure on current inputs may be considered as investment.

5.2 Input Use: The Aggregate Picture

Fertilizer and irrigation constitute the major components of input use in crop production in Bangladesh. Total expenditure on these two inputs over the last one decade are presented in Table 5.1 and Table 5.2. It is observed that total expenditure on fertilizer has been continuously increasing (except in years 1985-86 and 1993-94). Table 5.2 reveals a similar

pattern for irrigation. Except in 1985-86, expenditure on irrigation increased over the successive years. Table 5.3 examines the per centage of these expenses in the total value of crop production. The ratio increases more or less monotonically over the entire period. Thus assuming that crop production is undertaken entirely by private farm producers and agricultural credit forms only a small component of the input cost, the farmers have to spend an increasing per centage of their income on inputs. The average annual growth in the value of crop production during the period is 4.43 per cent and the average annual growth in input costs is 12.0 per cent. Thus the farmers are observed to invest a continuously rising per centage of their incomes on inputs and the return from such investment is not only low but declining. Therefore, it is a mater of great concern as to how long the incentive for such continuously increasing current capital investment from their own income may be sustained.

In 1985-86 and in 1993-94, there has been a decline in the total expenditure on these two inputs and the value added from crop production shows a decline and a very small increase respectively. During 1990-91 to 1992-93, the expenditure on the inputs increases at a growing rate, yet the growth in GDP from crops shows a declining trend. This is because, the rise in expenditure has been due to increase in the prices of inputs, particularly fertilizer (Table 5.1) and not due to increases in quantity. Table 5.1 and Table 5.3 together show that in periods of higher prices of fertilizer, farmers' expenditure on inputs increases and still the quantity of inputs is lower than in periods of low input prices. In fact, the farmers do not have alternative areas of investment and, therefore, they are forced to continue to spend on agricultural inputs even if the prices increase. But given their constraints, they cannot maintain the input levels in years of high input prices.

5.3 Household Level Determinants of Input Use

In a competitive situation, the amount of investment on various inputs is expected to be determined by the prices of inputs and output. However, in the rural areas of Bangladesh, market imperfections are pervasive and, therefore, a number of other factors are likely to play a significant role in determining the use of agricultural inputs and especially the total expenditure on inputs.

Imperfections in the credit market is the most important factor which act as a constraint to the use of optimal amount of inputs. Institutional credit for agriculture sector, especially for current inputs, is not available in sufficient amount or at the right time. As a result, the farmer's own resources set the constraints to input use. Current income may, therefore, have a close association with input use. There are, however, a number of counteracting forces which may weaken the positive association between the amount spent on agricultural inputs and income. The low income households may be under pressure to ensure subsistence and may, therefore, make attempts to accelerate the growth of income through investing a higher per

centage of their incomes.

In this respect, it is interesting to examine whether the income from non-agricultural sources contributes to expenditure on input use in agriculture, or the reverse process is in effect, i.e., the expanding scope for non-agricultural activities reduces investment in agricultural inputs. Similarly, the imperfections in land and labour markets may affect the quantity of application of inputs. For example, the small farmers may possess more family labour whose opportunity cost is low. There are complementarities in the use of inputs and, therefore, the availability of family labour may influence the use of other inputs.

With the advancement of modern agricultural technology, a concern has been expressed as to whether the small farmers would be able to make investment at the same rate as the more resourceful large farmers because of resource constraints. There are a number of factors which may negatively influence the amount of purchased inputs used by small farmers for growing modern varieties of paddy. These include; (i) the cultivation of modern varieties (which requires larger expenses on fertilizer and irrigation) involves a greater risk and the small farmers are risk averse; and. (ii) the small farmers have less linkages with government extension agents to induce the application of modern inputs. In contrast to these negative forces, small farmers' compulsion for producing a subsistence is likely to continue to exert a positive influence on input use.

Therefore, the nature of relationship between input use and the resource base of a household is likely to be resolved on the basis of empirical data. The findings from different empirical studies do not, however, converge to a single conclusion. Moreover, most studies analyse the determinants of the use of (or demand for) individual inputs. The focus of the present study is more on total expenditure on inputs and its correlates.

Most of the studies conducted in the past focused on the relationship of input use with farm size rather than with household income. The farm size is usually taken as a proxy for the resource base of a household. In the context of investment expenditure, the policy making framework also requires information on the propensity to invest out of current income. One of the reasons for a lack of explicit treatment of the relationship between income and investment in many studies, especially those on the determinants of input use through regression analysis, relates to the fact that in a regression equation, income itself is determined by input use and, therefore, the inverse relationship may not be acceptable. Therefore, the present study uses two-way tables to examine the relationships between income and expenditure on inputs before a multivariate analysis of the determinants of the latter is taken up.

The survey data provide information on current income and the per centage of income spent on inputs and the amount of expenditure on inputs by farm sizes. The per centage of income

spent on inputs for crop production and the variation of input use among different farm size and income groups may be used to identify the constraints to such investment. The data are presented in Table 5.4 and Table 5.5.

Table 5.4 shows that 5 per cent of total income of rural households is spent on inputs. It is expected that total expenses on material inputs will increase with farm size. This is shown in Table 5.4. However, the per centage of income spent on inputs does not increase monotonously with the farm size. It increases until 7.50 acre sized farms and thereafter slightly declines. This may be due to higher per centage of non-farm income for the larger farm size groups. It may, therefore, be useful to examine the per centage of farm income spent on inputs.

Table 5.5 presents data on the expenditure on input use by various income groups and the per centage of total income spent on inputs. Except the two lowest income groups (who are below the poverty threshold), other groups spend between 5 per cent to 5.8 per cent of total income on agricultural inputs. Table 5.6 shows that about 13 per cent of farm income is spent on material inputs. This is close to the estimates obtained from national data.

Table 5.1 Expenditure on Fertilizer in Bangladesh

	Amount of fertilizer (thousand metric ton)				*Price of fertilizer (Tk/Kg)*				*Total expenditure (Million Tk.)*				
Year	*Urea*	*TSP*	*MP*	*SSP*	*Urea*	*TSP*	*MP*	*SSP*	*Urea*	*TSP*	*MP*	*SSP*	*Total*
1984/85	832	346	69	-	4.58	4.67	3.54	-	3810.6	1615.8	244.3	-	5670.6
1985/86	782	293	59	-	4.80	4.71	3.82	-	3753.6	1380.0	225.4	-	5359.0
1986/87	915	336	66	-	5.22	4.92	4.12	-	4776.3	1653.1	271.9	-	6701.3
1987/88	1029	390	86	-	4.96	5.20	4.33	-	5103.5	2028.0	372.3	-	7504.2
1988/89	1135	416	94	-	5.06	5.26	4.38	-	5743.1	2188.2	411.7	-	8343.0
1989/90	1368	481	119	1	4.99	5.24	4.39	4.96	6826.0	2520.4	522.4	4.91	9874.1
1990/91	1323	514	147	12	4.98	5.61	4.56	4.96	6588.5	2883.5	670.3	59.5	10201.9
1991/92	1532	457	136	36	5.27	6.71	5.27	4.96	8073.6	3066.5	716.7	178.6	12035.4
1992/93	1547	407	126	120	5.79	7.85	9.96	4.96	8957.1	3195.0	319.20	595.2	14002.2
1993/94	1579	234	104	171	5.12	8.27	7.79	5.04	8084.5	1935.2	1935.2	861.8	11691.7
1994/95	1748	123	154	533	5.78	8.89	7.47	5.44	10103.4	1093.5	1093.5	899.5	15246.8

Source: BBS (1997), Shahabuddin (1997) Shahabuddin and Rahman (1998) and authors own calculations.

Table 5.2: Expenditure on Irrigation in Bangladesh

Year	*Total area irrigated (thousand ha)*	*Irrigation cost (Tk/ha)*	*Total expenditure (Million Tk.)*
1984/85	1787	2580	4610.46
1985/86	1757	2116	3717.81
1986/87	18601	2545	4733.70
1987/88	2094	2755	5768.97
1988/89	2409	3504	8441.14
1989/90	2598	3588	9321.62
1990/91	2665	3929	10,470.79
1991/92	2688	4138	11,122.94
1992/93	2838	4569	12,966.82
1993/94	2768	5000	13,840.00
1994/95	2986	5000	14,930.00

Source: BBS (1997), Shahabuddin (1997) Shahabuddin and Rahman (1998) and authors own calculations.

Table 5.3: Expenditure on agricultural inputs as per centage of Crop Value Added

Year	*Expenditure on Fertilizer and irrigation (C) (million Tk)*	*Value added from crops (G) (million Tk)*	*per cent change over previous year*	*per cent change over previous year*	*per cent of value added from crop spent on inputs= C*100 / G*
1984/85	10,281.10	154,671	-	-	6.65
1985/86	9076.82	139,489	-11.71	-9.82	6.51
1986/87	11,435.04	164,975	25.98	18.27	6.93
1987/88	13,273.19	167,646	16.07	1.62	7.98
1988/89	16,784.12	176,467	26.45	5.26	7.51
1989/90	19,195.75	194,211	14.37	10.05	9.88
1990/91	20,672.71	217,823	7.69	12.16	9.49
1991/92	23,158.33	222,451	12.02	2.12	11.29
1992/93	26,969.06	184,660	13.46	-16.99	13.35
1993/94	25,531.66	187,653	-5.33	1.62	15.50
1994/95	30,176.81	225,139	18.19	19.98	14.14

Source: BBS (1997), Shahabuddin (1997) Shahabuddin and Rahman (1998) and authors own calculations.

Table 5.4: Household Income and Expenditure on Material Inputs in Crop Production by Landownership Class

Land holding (acre)	*Average household income (Tk)* Y	*Average cost of material input per acre (Tk)* (M)	*per cent of income spent on material inputs* $\frac{M*100}{Y}$
00	3,577	99	2.77
0.01- .49	2,391	17	0.71
0.50- .99	3,283	149	4.54
1.00-1.99	3,548	224	6.31
2.00-4.99	5,123	424	8.28
5.00-7.49	6,878	638	9.28
7.50+	15,794	1,395	8.83
Total	3,599	182	5.06

Table 5.5: Household Income and Expenditure on Material Inputs in Crop Production by Income Groups

Household income group (Tk)	*Average household income (Tk)* Y	*Average cost of material input per acre (Tk)* M	*per cent of income spent on material inputs* $\frac{M*100}{Y}$
00-1400	953	28	2.94
1441-2400	1,900	80	4.21
2401-3600	2,948	149	5.05
3601-4800	4,175	243	5.82
4801-7200	5,839	320	5.48
7201+	14,305	777	5.43
Total	3,599	182	5.06

Table 5.6: Farm Income and Expenditure on Material Inputs

Income / expenditure	*Amount (Tk) / per cent*
Total household income	3599
Hosuehold income from farming	1435
Household income from non-farm sources	2164
Amount spent on material inputs	182
Farm income spent on inputs (per cent)	12.7

5.4 Multivariate analysis: determinants of expenditure on inputs

A multivariate analysis has been used to examine the determinants of expenditure of inputs of rural households. The dependent variable is the total expenditure on inputs. The size of owned land is included as an explanatory variable to derive insights about the determinants of input use per acre. The square of land is used as an explanatory variable to test the conventional hypothesis of a negative relationship between farm size and input use.

The source of income may have an impact on expenditure on agricultural inputs. Whether the household receives remittances and income from non-agriculture sources are, therefore, included as independent variables. Other explanatory variables in the regression equations are: gender of head of household, amount of institutional credit, and distances of various infrastructure facilities.

The regression analysis (Table 5.7) reveals that the complementary family inputs e.g. land and labour have positive impact on material input use though the coefficient of the number of adult male is not significant. Non-agricultural income also has a positive impact which reveals that there is a constraint in the availability of cash for the purchase of inputs. A dummy for male headed households included to examine whether female headed households face a disadvantage in this respect generates insignificant coefficient and reflects that there is no gender bias in this respect. The remittances also do not contribute to increased input use and has a significant negative coefficient. The impact of institutional credit is not significant and this is because such credit is usually obtained for other purposes and agricultural credit forms a small per centage of institutional credit supply.

Table 5.7: A Regression Analysis of the Determinants of Expenditure on Agricultural Inputs

Explanatory variable	*Coefficient*	*Value of t*
Cultivated land	242.87	19.77
Square of land	-2.62	-13.09
Non-crop income	.04	8.77
Remitttance	-134.46	-1.88
Adult male	32.35	1.26
Male Head (male=D)	98.72	.73
Crdt ins	-.05	-1.53
Distance of bank	-5.59	-.93
Distance of bus stop	-3.04	-1.10
Distance of electric supply	-28.76	-3.07
Distance of haat	55.00	3.17
Area of village irrigated	3.22	4.08
Constant	-104.55	-.73

The distance of infrastructural facilities [e.g. bank, road links (bus stop), electric supply] has negative impact on the expenditure on inputs and this is quite expected, except that the coefficient of the distance of haat is positive. This is difficult to explain and may be because of data problem. Per centage of area irrigated in a village has a positive impact which is also expected. The explanatory power of the equation is acceptable.

Chapter 6

Gender and Savings

6.1 Rationale for a gender disaggregated analysis of savings

The studies on the determinants of savings are usually conducted on the basis of households as the unit of analysis. The analysis on determinants of savings in earlier chapters follows similar tradition. This is a useful practical approach since saving is usually a household decision. This is especially true in the rural areas of Bangladesh where earnings cannot be attributed to individuals because family members jointly contribute labour to family farms and enterprises.

It is still desirable that separate estimates of savings of individuals within a household are obtained. This would be useful for, for instance, in identification of the gender differential in savings behaviour. However, the survey data do not provide such disaggregated information.

To understand the gender differences in savings behaviour, the study uses a different approach. The savings rate and savings behaviour among the male and female headed households have been distinguished. The underlying hypothesis is that the perceptions of female heads of the households about the needs for family savings may differ from the perceptions of the male heads and they may as well put their savings in different forms.

The problem of comparison among male and female headed households emerges from the fact that the two groups may have other important differences. Moreover, there are controversies on the definition of female headed households. The major difference in definition arises from the question of whether the non-resident male member of a household should be considered as the head of the household or, in such cases, the woman who is in current charge of managing the household should be considered as the head of the household. In such cases, women are termed as `de facto' heads of households. These households do not, however, suffer from the absence of male earners which characterizes the `de jure' female headed households.

The female headed status may influence household savings through its impact on income as well as on motives behind savings. If one focuses on all the ‘de facto’ and ‘de jure’ female heads, then the impact of gender operating through lower income and lack of male earning members will not be captured. In the survey data, both the groups have been categorized as female headed households. Since the distinguishing characteristic of `de jure' and `de facto' female headed households is that the latter group is supported by a male head who resides away from the household, the receipt of remittances may capture this phenomenon.

Therefore, in the present study those who do not receive remittances have been identified as effective female headed households. Thus two types of female headed households are considered: those who get remittances and those who do not.[7] To compare male and female headed households, the former has also been classified in a similar way.

The savings propensities of men and women may be different because of differences in attitude towards savings. At the same time, the difference in the absolute level of savings by women and men deserves attention since total savings in the hands of women is an indicator of their empowerment.

Women's thriftiness is almost mythical in this country. Small savings of women may enable a family to sail through the periods of crisis. Women are found to save in the form of handful of rice, put away daily at the time of cooking. Women save in the form of chickens, goats and other animals. The survey data, however, do not include these details. Some case studies have been presented in the next sections to supplement the quantitative analysis. The case studies illustrate the forms in which women put their savings.

6.2 Savings Propensities of Female and Male Headed Households

In this section, data on savings rates of male and female headed households of different income and landowning groups are presented (Table 6.1 and Table 6.2). It has been demonstrated in Chapter 3 that income is one of the most important determinants of savings. Therefore, the savings rates of male and female headed households, and among the remittance recipients and non-recipients, are presented for various income groups. On the aggregate, savings rates of male and female headed households are very close, 16.4 per cent and 15.6 per cent respectively. This does not corroborate the view that women show greater thriftiness.

Table 6.1: Savings rate among male and female headed households by income groups

(per cent)

Household income group (Taka/ month)	*Receiver of remittances*		*Non-receiver of remittances*		*Total*	
	Male headed	*Female headed*	*Male headed*	*Female headed*	*Male headed*	*Female headed*
0 -1440	-51.13	-26.48	-90.71	-45.82	-80.92	-32.76
1441-2400	-14.92	2.89	-22.38	10.47	-20.68	6.86
2401-3600	2.26	6.40	-0.30	25.46	0.17	15.64
3601-4800	0.75	32.62	7.93	11.29	6.78	26.38
4801-7200	24.35	24.90	23.61	42.39	23.75	31.08

[7] Remittances usually come from household's male earners, women sending money has not been observed in the survey data.

7201+	51.11	32.58	52.33	58.09	52.10	39.35
All groups	16.76	14.01	16.25	18.26	16.36	15.56

Table 6.2: Savings rate among male and female headed households by landownership class

(per cent)

Household landowner-ship (acres)	*Receiver of remittances*		*Non-receiver of remittances*		*Total*	
	Male headed	*Female headed*	*Male headed*	*Female headed*	*Male headed*	*Female headed*
00	3.28	4.69	-0.90	10.11	0.13	6.87
0.10-0.49	0.93	25.07	2.64	23.73	2.23	24.69
0.50-0.99	9.54	15.72	12.58	19.07	11.96	17.00
1.00-1.99	23.72	-9.05	12.97	16.11	14.86	-0.41
2.00-4.99	21.14	43.22	21.00	25.97	21.02	34.92
5.00-7.49	66.46	51.75	23.63	55.11	36.99	52.99
7.50+	48.99	17.42	54.74	-	54.53	17.42
All groups	16.76	14.01	16.25	18.26	16.36	15.56

A disaggregated analysis, however, provides a different picture. Table 6.1 shows that among the remittance receivers, male headed households have slightly higher savings propensity. The female headed households, who do not receive any remittances, have a higher savings rate than the corresponding male headed households. Another finding which emerges from the table is that in all income groups below the highest group (i.e. less than Taka 7,200), savings rates among female headed households are much larger than the male headed households of the respective income groups. The differences are higher as one goes down the income scale. Thus the fact that households which are apparently female headed but receive remittances from outside and fall in the highest income strata have lower savings rate than the corresponding male headed households blurs the picture of the savings efforts of poor women-headed households.

A similar picture is obtained from Table 6.2 which presents data on savings rates of male and female headed households belonging to various landowning groups. The conclusions are similar to those obtained for different income groups. The savings rates of women are much higher than men in the small landowning groups and among those who do not receive remittances.

Next we examine whether the male and female headed households show any difference in the type of asset ownership. The data on asset ownership is presented in Table 6.3. The first notable feature is the very small value of agricultural assets among women. The average value of agricultural asset owned by male and female headed households are Taka 1,266 and Taka 58 respectively. The low ratio of agricultural assets owned by female and male headed households holds for all income groups and for both remittance receivers and others. The other feature which emerges from the table is that the female headed households possess

assets worth of much smaller value compared to male headed households. This is true also for those groups of households where the female headed households demonstrate higher savings rate compared to men. Here one should bear in mind that the value of assets shows the cumulative effect of asset accumulation over the years and the formation of female headed households may involve processes which lead to depletion of assets or dispossession.

Table 6.3: Value of different types of assets owned by male and female headed households in different income groups

(Taka)

Household income group (Taka/ month)	*Receiver of remittances*				*Non receiver of remittances*				*Total*			
	Male headed		*Female headed*		*Male headed*		*Female headed*		*Male headed*		*Female headed*	
	Agr.	*Total*[*]	*Agr.*	*Total*	*Agr.*	*Total*	*Agr.*	*Total*	*Agr.*	*Total*	*Agr.*	*Total*
0 -1440	66	12441	16	8084	285	21284	57	11277	232	19154	29	9082
1441-2400	310	22774	30	18069	614	31867	88	20105	545	29800	59	19102
2401-3600	227	37527	40	24269	710	42781	120	58648	618	41778	78	40827
2601-4800	641	61536	0	48369	1350	60042	0	33795	1240	90274	0	44082
4801-7200	1612	79090	46	79764	3400	89159	0	47774	3057	87227	29	67768
7201+	1676	150918	429	113011	6367	166659	25	125093	5406	163437	301	116827
All groups	493	42510	53	26391	1473	92032	67	29746	1266	51185	58	27667

Note: [*] *Include productive assets and consumer durables*

In the earlier chapters, the relationship between savings and various types of social, economic and family crisis has been examined. In general, crisis leads to lower savings. The savings rates of male and female headed households with and without exposure to crisis during the last one year are likely to reveal important gender implications. Table 6.4 presents the pertinent data. It is observed that the savings rate of male headed households who experience any crisis is much smaller than households who do not experience any such crisis. The savings rates of these two groups are - 0.61 per cent and 17.59 per cent respectively. In contrast, female headed households, with and without experiences of crisis, show similar savings rate (15.7 per cent and 15.5 per cent respectively).

The poor female headed households, who are exposed to crisis, deserve closer attention in this respect. The poorest male and female headed households have similar savings rate. In the next two income groups, who are just below and above the threshold of poverty, female headed households demonstrate higher savings rates (and positive rates) compared to the lower (and negative) rates among the male headed households.

Table 6.4: Savings rate among male and female headed households by incidence of crisis

(per cent)

Household income group (Taka/months)	*Households facing crisis*		*Households with no crisis*	
	Male headed	*Female headed*	*Male headed*	*Female headed*
0 –1440	-105.04	-104.51	-78.56	-26.09
1441-2400	-31.50	14.82	-19.69	6.38
2401-3600	-10.01	19.21	1.02	15.42
2601-4800	1.09	-	7.35	26.38
4801-7200	30.50	-	23.20	31.08
7201+	38.43	61.33	52.78	35.87
All groups	-0.61	15.73	17.59	15.54

6.3 Savings and Women: Case Studies

In this section, a few case studies on savings by women are presented. The case studies provide evidence of ingenuity among women who try to balance between riskiness of investment and return from such investment. The examples on types of investment are not intended to provide an exhaustive list of various forms in which savings may be utilized. Though the quantitative data presented in the study do not permit to distinguish the savings by a male and a female member within a household, the case studies presented below demonstrate that women in a family may play a crucial role in generating savings.

6.3.1 Saving handful of rice

Saving a handful of rice everyday is common among the rural women and is a traditional practice especially among the poor women. When women cook their meals, they save a handful of rice in another pot. They usually sell the rice after it is full. The poorest women may not sell it, but consume it in periods when there is no earning.

A judicious use of the money obtained from such savings may open up opportunities for a family. Such an example is provided by Sajeda Begum. At the age of seventeen, Sajeda was married to Takdir Hossain. This was about fifteen years ago. Her husband did not possess any land. He worked as a `khadem' with a 'peer' and earned about Tk.50-60 per day. Three years ago, while lighting a `hazac' lantern, he met with an accident; the lantern exploded and he was critically injured.

Since her marriage, Sajeda used to save a handful of rice. During the initial years, she used the sale proceeds of the saved rice to buy utensils and other household goods. At the time of her husband's accident, she spent Taka 1,000 for his treatment. After three years of her marriage, the savings obtained from the sale of rice was used to buy two goats for Taka 800. The herd grew and she sold two goats and three remained. The sale proceed from the two goats was used to mortgage in 15 decimals of land. Recently, she has purchased chicken and goats with her own savings.

Now a days, she is able to save from her cash income from the sale of eggs and chicken. She saw the face of prosperity because initially she saved rice and had an inclination for austerity and savings.

6.3.2 Money lending

Piara Khatun describes her husband Katu Mia as 'a very simple man'. He works as a sharecropper and wage labourer. His father and brothers deprived him of the family's agricultural land.

Her husband's income was barely sufficient to meet the expenses of the family with four children. So Piara borrowed some money from her father and started paddy processing. They worked hard and earned about Taka 30,000 during a year, a part of which was used for lending to other poor households. From the returns from this business, she saved more than half of the income. Since returns from such loans were high, savings multiplied quickly. Last year, they purchased 75 decimals of land for Tk 40,000. This year they built a homestead on a part of the land.

Most of the investment decisions are taken by Piara. They had to build the house since Katu Mia's father did not allow him to live on his land. The case is another example where women's high savings propensity and control over savings and investment decisions may produce good results.

6.3.3 Saving in livestock

The series of case studies will not be complete without a woman who borrows from the NGOs and has established herself as a successful entrepreneur.

Anwara is the wife of a poor day labourer. Her husband and the son could not earn enough for the family of seven members. Anwara met the field worker of an NGO who motivated her to take loans from the NGO and start some economic activity. She obtained her first loan of Taka 2,000 with which she bought a cow with a calf. She earned about Taka 30 daily from the sale of milk. She paid her instalment from the money and saved the rest (this gives a savings rate of about 75 per cent). The cow gave birth to more calves over the next years. Two of them are used for ploughing the land. This pair is lent to other households and during the three-four months of a year she earns Taka 60 per day from renting the bullocks.

She received Taka 3,000 as her second loan from the NGO. She invested in paddy processing. During the last three years, they ventured into two other major investment activities.

- They lent their savings against 210 decimals of agricultural land. The rate was Taka 4000 for each 30 decimals;

- They bought a thresher machine for their son. He receives 5 maunds of paddy for threshing 100 maunds. During the harvesting season, he earns about 15 to 20 maunds of paddy.

Appendix Tables

Table A6.1: Value of assets among male and female headed households by income groups

(Taka)

Household income group (Taka/ months)	*Receiver of remittances*		*Non-receiver of remittances*		*Total*	
	Male headed	*Female headed*	*Male headed*	*Female headed*	*Male headed*	*Female headed*
0 –1440	14957	11944	22910	9677	21019	11231
1441-2400	23843	20873	30160	18177	28742	19505
2401-3600	38310	69432	45551	58153	44164	64002
2601-4800	48615	37079	47365	31384	47561	35404
4801-7200	62339	51472	69171	64696	67860	56431
7201+	116520	49105	110614	12785	111823	37636
Total	38008	24728	45031	22383	43557	23841

Table A.6.2: Value of assets of male and female headed households, 1996 and 1997

(Taka)

Household income group (Taka/month)	*Receiver of remittances*				*Non-receiver of remittances*				*Total*			
	Male headed		*Female headed*		*Male headed*		*Female headed*		*Male headed*		*Female headed*	
	1997	*1996*	*1997*	*1996*	*1997*	*1996*	*1997*	*1996*	*1997*	*1996*	*1997*	*1996*
0 -1440	12441	14957	8084	11944	21284	22910	11277	9677	19154	21019	9082	11231
1441-2400	22774	23843	18069	20873	31867	30160	20105	18177	29800	28742	19102	19505
2401-3600	37527	38310	24279	69432	42781	45551	58648	58153	41778	44164	40827	64002
2601-4800	61535	48615	48369	37079	60042	47365	33795	31384	60274	47561	44082	35404
4801-7200	79090	62339	79764	51472	89159	69171	47774	64696	87227	67860	67768	56431
7201+	150918	116520	113011	49105	166659	110614	125093	12785	163437	111823	116827	37636
Total	42510	38008	26391	24728	53505	45031	29746	22383	51185	43557	27667	23841

Chapter 7

Priorities for Future Research and Policy Implications

7.1 Priorities for Future Research and Limitations of Present Study

The major limitations of the study originate from the scope of the survey data. It should, however, be noted that the poverty survey was not conducted with the purpose of analysis of specific issues e.g. savings and investment. Therefore, the scope of the data set does not contain the detailed information, which are required for the present study. The important shortcomings in this respect relate to the following:

- the value of several critical assets e.g. housing, inventories of produced goods, stock of goods in retail shops is not available;
- information on financial assets are not provided; and
- loans provided to others are not included.

As a result of a lack of comprehensive information, the study could not differentiate total savings into two major components e.g. total physical capital formation and net financial savings, formal and informal. Such a breakdown has the advantage of generating information on the potential amount of savings which could be mobilized through financial institutions.

The present study also analysed the determinants of farm investment and use of agricultural inputs. For a satisfactory analysis, disaggregated data are needed on investments in other economic activities. This could be useful in examining the efficiency of current pattern of resource allocations.

At present, most financial savings among the rural households take the form of informal channels. This ranges from cash in `bamboo holes' to informal lending to other households. The use of institutional savings services is insignificant. The mobilization of rural savings requires that a range of savings services are provided to the rural households by the formal financial institutions. For this purpose, the reasons behind the current situation of low access of rural households to institutional savings services should be identified and effective measures are needed to address them. While the present study examines several pertinent issues on savings behaviour of the rural households, the interrelated issues should receive attention in future research.

7.2 Policy Implications

The failures of the banking institutions in reaching the rural households are usually identified in terms of inadequate credit facilities in the rural areas. As a result, the lack of savings services of formal financial institutions for the rural households has attracted inadequate attention in the past. This has usually been justified on the presumption that the savings rates of rural households are low and/or most of the savings are reinvested in productive activities and, therefore, the savings services are not in demand.

The present study shows that the savings rates among the rural households are substantial, about 16 per cent of income in the aggregate, and investment on physical capital does not account for all savings. It has also been argued that a part of investments in physical capital takes place since facilities for financial savings are lacking. Therefore, it is pertinent that formal financial institutions should make concerted efforts to mobilize savings. Studies (Rahman 1998) suggest that there is a lack of awareness among the rural people about the savings facilities offered by commercial banks. Long distances of the branches of the banks are often cited as a major reason behind their inability to use the services. This calls for policies to make the rural people aware about these services and to take the services closer to the villages.

The policies of savings mobilization should be combined with appropriate credit policies to enable the rural households to undertake investment in suitable activities and at proper time. The present study identifies a major lacunae in farm investment. The only form of farm investment which is taking place, is the installation of inexpensive STWs. This is hardly sufficient for the development of the farm sector. Moreover, the low capital cost of the poor quality STWs may be suitable for the credit constrained farmers but may imply a non-optimal allocation because this will lead to higher maintenance and repair cost and higher cost of operation resulting in higher charge of irrigation per unit of land area.

Improvements in farm productivity require planned investment on farm machinery and land improvement. The increased access to credit is expected to encourage such investment, though this may not be sufficient for such an endeavour (prices of other inputs and output are also relevant in this context). Institutional factors may also play an important role.

It has been revealed that the farm households spend a significant proportion of their income on inputs for agricultural production and increasing the use of inputs improves the productivity of land. In the absence of large investment on physical capital, policies should be adopted to enable the farmers to use material inputs in required quantities. In this respect,

the support in the form of short term credit will enable the farmers to plan the use of optimal quantities of inputs. The problems of provision of short term credit for purchase of material inputs include high cost of such operations and constraints in timely disbursement of loans. Agricultural inputs must be applied at the right time in the crop season and delayed sanctioning of loans may not serve the purpose and may also lead to the unproductive use of the loan and thus creating problems of non-repayment.

Two interesting features have emerged from the present analysis. The remittances received from outside the villages are seldom put to productive use. The agriculture sector also has not been able to attract much investments from remittances. The analysis on the use of remittances, however, could not be undertaken under the scope of the present study. Such analysis should be carried out to identify the factors which discourage the use of remittances for investment in the farm sector and measures should be taken to remove them.

The present analysis of the determinants of savings and investment in farm activities also tried to identify related gender dimensions. For the purpose, the savings and investment behaviour of male and female headed households have been examined. The gross savings rate among the female headed households (who do not receive remittances) is found to be higher than similar male headed households in all but the highest income group. In fact, data on savings rates demonstrate that the poor women without support from male earners have much higher savings propensities. The regression analysis on the determinants on investment in farm assets and in material inputs shows that there is no significant difference between the male and female headed households. The case studies cited in the study suggest that women who adopted a diversified portfolio have led them to a path of increasing prosperity. Women's capacity to generate savings, even in the face of various adversities, demands that they receive attention in policies for mobilization of savings. In this respect, they need support from both savings and credit services of the financial institutions.

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